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NOTES

from

Hodges' Lectures

on the

Principles of Surgery.

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1830.

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Irritation.

When we say that a part is organised, we mean that it contains bloodvessels, nerves and absorbents; altho' we cannot demonstrate it, we have every reasonable ground to believe that they exist; and I shall be under the necessity of assuming it as a principle, that the nerves of organic life are distributed to the minutest ramifications of the bloodvessels as I incline to the belief that all impressions are previously made on the nervous system.

Particular parts require particular stimuli, and as Brown says, life is supported by it: the Heart and Arteries are stimulated by arterial blood; the lungs by atmospheric air: the stomach by the food, the stomach excites the Liver Pancreas and Intestines thro' the medium of sympathy. Moreover the healthy action of one organ is necessary for that of others and on it depend the phenomena of health; as the healthy action of the stomach is necessary for that of the Brain &c. &c. hence if a stimulus either in quantity or quality unnatural be continued or applied for any length of time derangement takes place and the part is said to be in a state of Irritation which may be defined to be a morbid excitement of the organic

actions, or in other words it is nothing more than the action or effect of an irritant on an irritable organ, and varies according to the tissue in which it is situated, of which there are three, if we divide the nervous system (as is generally done) into Ganglionic or Sympathetic, Cerebro-Spinal there will be four, and hence we have four irritations. The tissues are organic, nervous, Sanguineous, and absorbent; the two first are primary the other secondary, each tissue carries its own influence into every organ.

By Irritability we mean the capability of receiving impressions. To constitute sensibility we must have a sentient surface, conductors and a part capable of receiving impressions.

Sympathy is the suffering of one or more organs together.

I am inclined to believe that whenever Irritation is produced it first attacks the Ganglionic system of nerves and thence is conveyed to the other tissues nervous irritation arises when the spinal marrow is acted upon: organic irritation is sometimes alone present as in small pox, contagion, measles &c. this is sometimes followed by absorbent irritation.

1st I shall speak of organic irritation and also of the proper nervous Irritation; both of which I shall call simply Irritation, which term in the ensuing Lectures you will understand to apply to those two; as I shall generally prefix the term Sanguine and absorbent when

I allude to those Irritations.

An Irritant may be directly applied, or Irritation may be produced by the abstraction of stimuli; as by bleeding, irritation & inanition &c. These are diffused by sympathy, which is sometimes confined to the organic, and sometimes to the cerebro spinal system, while again both are affected. The Brain is sometimes the medium of this sympathy and as when paralysis on one side is caused by the irritation of a carious tooth on the other.

Irritation is either Local, General, or Partial. In the first no sympathetic action is induced, it is difficult to find examples of this kind, and by some it is denied, but in general we may say that Local Irritation is when the organ alone is affected, and is always present before vascular action can take place, or in other words that state of the part which intervenes between the application of a stimulus and the evident disturbance of the sanguine and nervous systems, as when a splinter is put into a tendon: in some cases, for instance, as when a mote is placed in the eye there is no appreciable space of time before the bloodvessels are affected: also in the contagion of small Pox.

Proper nervous Irritation is evinced immediately by Pain and may be known by its affecting the other organs by sympathy, and which is often much severer than the primary one and of a different kind, as when Irritation of the stomach

General Irrit:

causes Irritation of the Heart, as shown by palpitations: this is what Astley Cooper terms sensitive irritation.

Irritation may be said to be Partial when several organs only are affected.

General Irritation is where the Brain and spinal marrow with the Ganglionic system are effected, as in Tetanus, Hysteria, Fevers &c. It is however denied by some that every organ can be affected at the same time. In Intermittent there is general Irritation. Organic Irritation cannot continue long before vascular action takes place; in a larger majority of cases both tissues are affected at the same time; but it generally depends one constitution, habit, climate, disease &c.

In post mortem examinations from pure nervous irritation, no disorganisation is seen, when however the vascular apparatus is involved we find engorgement &c. In many cases of sudden death from concussion of the Brain, there is nothing to be perceived, but if the patient lives for any length of time there may be effusions &c.

Irritability is modified by age, that is it is greater in children than in adults: as in them Convulsions and Tetanus are apt to occur from very slight causes and their organic actions are easily exhausted by stimulants; hence surgical operations are more rarely performed on them.

This in common language is called the effect of weakness. I mean by strength the power by which a person is

enabled to resist or bear diseased actions or impressions; and by weakness the diminution of these powers. Hence Old People have but little susceptibility to diseases, but when once established, they possess but little powers of recovery. This also much modified by Sex, as Females are much more irritable than Males. Also according to the Temperament and whatever weakens the system as Blood letting, or exhausting discharges of any kind, on this account, the Surgical operations prove more fatal in the Tropical Climates than elsewhere. In those countries they are also more liable to be affected by Tetanus, Erysipelas, Mortification &c.

In Sympathy the Cerebro Spinal nerves have not much concern in its propagation, for 1st it exists in Plants; & 2dly in higher animals a paralytic limb has caused death without nervous irritation. But when it exists in the nerve then it is propagated, and most frequently in the sentient extremity of the nerve, very often in the opposite direction as in Irritation of the Uterus &c, and even sometimes thro' the brain to the nerves of the opposite side, as in the instance of a carious tooth. The irritation is transmitted to the blood vessels, and causes an increase of secretion &c. Organic irritation is the proximate cause of sanguine irritation. Nervous irritation is transitory and never gives rise to sanguine irritation directly.

There are some exceptions however to its not being dangerous as pain has caused death: affections of the nerves of the brain, cramps as in the muscles of the Larynx; but

but in these cases it is oftener combined with sanguine irritation. Irritation is severe ~~inversely~~ inversely as there is strength.

Treatment. First remove the exciting causes, whether external or internal, mechanical, or chemical. But often it arises sympathetically from local irritation, this latter must be diminished or subdued. Sometimes even when it is removed the sympathetic affection still remains, in both cases we must endeavour to diminish organic action. For this purpose one of the most powerful remedies is cold, either cold air or cold. Cold drinks or affusion or immersion, this however cannot be used where there is congestion or prostration. 2dly Narcotics. All these diminish the susceptibility of the nervous system. Most of them however produce a stimulating effect on the vascular system, hence they are called stimulating narcotics, on this acct some care is necessary. Opium is considered the best, before fever is developed, and sometimes after in judicious combination. Hyoscyamus is said not cause vas: irritation, sometimes Digitalis is preferred. Asafoetida, Hop, Ether, Puss: Acid &c are all recommended and preferred according to circumstances. 3dly Indirect modes are applied such as taking away food, which is the natural stimulant of the stomach: also the detraction of Blood which is the nat: stimulant of the Heart. The Loss of Blood will sometime, however aggravate the irritation (as whatever weakens will augment it). Tonics are sometimes employed, and will be found useful, provided, they do not

increase the fever; so also a nourishing diet, but with caution, as we must always avoid excitement at the same time we give strength. When the strength is diminished by long abstinence then Tonics must be used. The preceding remarks apply chiefly to General Irritation, but in the Local and Partial we have revulsive means as Sinapisms &c. Here Equalize excitement, and detur-mine from the part affected. When Engorgement exists we employ Local V.S. Here also require the internal use of Narcotics (not in high cerebral affection): and also cold which may be applied with advantage over the part.

I wish now to make a few remarks on the state of the system called Sedation. This term is not generally used by authors. however it is considered as a diminution of organic action. Sedation is produced directly and indirectly. Directly as when cold is applied, or there may be sedation of one part while there is irritation of another, as in Inflam: of Brain attended with Cold Feet.

Instead of the blood rushing from a part that is in a state of sedation, it is excluded from it, as when cold is suddenly applied the part becomes purple, the blood being detained, but after a short time it becomes pale the blood ~~being excluded~~ having receded; when the blood is thus excluded, there is congestion of the venous system; and the congestion of the viscera is most permanent. Irritation of an organ will produce indirectly in another, as in the Lungs there is seen sometimes great action while the Skin and parts

Causes of Ledation are excessive heat as a scald or cold.

directly over them are in a state of sedation. Sedation may be either local or general, as an instance of general we may mention old age. Mania à Potu; and in Consumption the lungs are irritated while there is sedation in all the other organs; in hybernating animals &c.

When the cause is removed we have reaction which is sometimes very violent, sometimes a natural reaction takes place. Occasionally an irritant will produce powerful sedation, as when heat is applied just below that temperature which produces disorganisation.

Prostration, is when the part is depressed below the natural standard: here we have sedation and debility; we may have prostration of a part as well as a whole. This is seen when persons have been plunged into boiling water, or in gun shot wounds: long continued pain: profuse evacuations of any kind: poisons &c. the patient becoming pale; feeling a sensation of chilliness, dilated pupil, dryness of tongue and fauces, cold feet and hands, twitchings &c.

The consequences of sedation are comparatively of little importance. There is here no sympathy except perhaps in the brain, which is the reservoir of the nerves, if there is sedation it may be transmitted, or in the heart in the same way. It is more serious when general.

Treatment. First remove the cause, then resort to stimulants &c. When there is congestion and sedation we must use both evacuants and stimulants, as in Hysteria &c.

Phlegmon is Infl. of cellular tissue.

N. S. acts here by unloading the congestion, and we should stop when reaction is established. The blood at first will be found to flow very slow in consequence of its thickness but as the circulation is established it will be found to flow much faster. When there is prostration resort to internal and external stimuli. As Narcotics, Opium, Vol. Alkali Ether. and Brandy. Opium will be found the best. If however the patient is sinking we may apply Dry Heat or even Boiling water to certain parts of his body, to act as revulsants. Some authors make no distinctions between loss of action and loss of Power. This may be shown as follows. Take two race horses one remarkable for speed and the other for strength. the strong horse will beat in a long race.

Sanguine Irritation

The common sensation in this disease is that of heat or burning, from which its name has been derived: common or simple inflammation which always implies irritation, as defined by authors is situated in the skin and cellular membrane. When rapid in its progress it is called acute. When slow Chronic. Not unfrequently there is another kind termed specific as small Pox - Measles &c.

I shall first speak of simple acute Inflam: in cellular tissue as occurring in a healthy individual. Since the time of Celsus there have been four prominent symptoms, Swelling, Redness Pain, and Heat. Whenever they are present we may be sure

The soft oedematous feeling of an inflam: part arises from the free deposition of serum.

"Ubi Irritatio, Ibi Afflueus".

In Eruptive diseases it is itching; in Cancer sharp & lancinating

there is Inflam. But these symptoms are not always present.
Neither is there any regularity in their accession.
Swelling. is the most common of all the symptoms Inflam: has its seat in the capillaries and swelling arises from an enlargement of these vessels (see Thomson) as an illustration I refer you to Hunter's experiments (after the disease has continued for some time, there is an effusion of serum and lymph, the latter of which causes the hardness and tension which is felt. Redness. As the vessels are more dilated, more red globules enter, and the serous vessels which formerly transmitted serum now convey red blood the whole of which is brighter than usual. Hunter thinks this owing to a more rapid circulation.
Pain is a very important diagnostic, and sometimes is the only indication of Inflam: in deep seated parts. It differs very much in different parts; if situated in the Glands it is dull and heavy; if in the Cellular membrane it is throbbing and acute: in the Skin, sharp biting: very acute and sharp in the serous tissues: in the Lungs gravitating: in Bone obtuse and very painful and in Erysipelas burning. The Pain arises from an increase of sensibility (in the part) excited by the application of stimuli, and is not always dependent as some suppose upon the degree of pressure, as may be refuted by the circumstance of Pain being sometimes the first symptom and before the enlargement of the Capillaries has taken place: at the same time it cannot be doubted that pressure does aggravate it: as when it is situated in dense unyielding parts, as Bone or Fascia ~~the~~ if divided or if

The secretions of a part are always suppressed.

poultices and cold be applied it will mitigate the violence in a startling manner. Also the more rapid the inflam: the severer the pain, this is true as respects persons whose systems are not all irritable; while the reverse is the case with those whose constitutions are strong; motion also as well as a depending position increases it. Heat The temperature is increased both to the feel and thermometrically. but not beyond the temperat: of the blood. 98° or 100° very rarely 104° The great heat complained of by the patient is owing to an increase of sensibility which is much severer in the Skin, Pleura, Intestines, & Stomach, than in the Cellular membrane, muscles, Brain, Lungs, Bones & Parenchyma. It is supposed to be produced by the Irritation of the nerves. These are the prominent symptoms but there are many secondary. If a muscle or any organ is inflamed it cannot be exercised. Pain in the course of the Sciatic nerves denotes Inflam: of the Hip Joint. If in loins of a Male disease of Testicles: of a Female of the Uterus: a pain in the shoulder Hepatitis &c. This is called pain by sympathy There is also universal sympathy as in Fevers which result from the nerves.

In all inflammatory fevers there is an increased action of the heart and arteries, manifested by a full, strong, frequent and hard pulse, accompanied by a diminution or suppression of all the secretions. The Skin, nostrils, fauces and tongue are dry. urines do not secrete, anorexia, urine diminished, and the nervous system is also affected, & giving

turgescence of and capillaries

Vide Hunter on Blood. 2d Pt Chap. 3.

rise to very unpleasant sensations there is also great capillary distention, precordial uneasiness, loss of sleep &c. &c. which gives rise to flush and fulness of face. Sizy Blood is another symptom of inflam: That this may appear the orifice should be large so that the blood may flow freely. The coagulum dense and firm will be found floating in the serum with elevated edges or in a cup form and covered with a yellow or buffy coat & which does not adhere to the sides of the vessel. To do this however it should cool in a moderate temperature and it will be found proportioned to the degree of inflam: Pregnant females have this peculiarity of the blood, as also those whose circulation is below par. There are some other exceptions as scurvy &c. but generally it is an indication that there is some kind of change in the vascular action. which is modified according to the tissue in which it is situated and it is sometimes the only symptom of inflam: in deep seated parts. Friday

The Local symptoms are modified according to the part in it is situated. The nearer the surface the severer the inflam. It is also greater on the side next the surface, as an illustration of this, balls and other foreign bodies become encysted, and remain a great length of time without any injurious effect whatever, deep seated inflam: is easier cured. 2d They are modified in proportion to the distance from the centre of circulation, as it is greater on the body than in the extremities. 3d The position is another thing to be taken

Parts that are not organized are incapable of Inflammation. Also Cartilages, i.e. articular cartilages.

=ant are all more or less perceptible to our senses.

A or a certain predisposition to disease.

Mechanic, are those which injure the function of a part.

into consideration. When it is in a depending part the blood is determined to it by its gravity and consequently the inflam is much greater. The reverse is the case in a part that is or can be elevated, by which the venous blood is drained from it, and the arterial prevented in a great measure from entering. 4th Modified by Tissue. 5th by the Organ affected. 6th the peculiar state of the parts, as those that have been newly formed, cicatrices in a part that has been injured. (tumours are soon destroyed by Inflam.) 7th the Age of the patient has much influence. irritability is predominant in infants, whereas in old Persons it is hard to excite, but the restorative process is very difficult. 8th Constitution has much effect. also Temperament, Sex, Habit. Climate, & Season.

Causes. They are divided by Surgeons into Exterval and Internal. The external are those which operate from without. The internal are those produced by or depending on the irritability of the General system. The external Causes are subdivided into Mechanical, and Chemical. The Mechanical act by a direct injury of the part as Contusions, Wounds, Fractures, Foreign bodies in Cavities as Calculi, &c. Extravasation from accidents, of the contents of Stomach and Intestines into the cavity of the abdomen producing Peritonitis &c. Friction and Pressure from tumours &c. The Chemical are all those which excite by their Chemical action (irritation) as Cantharides, Mustard, Turpentine, Acids, Poison, Heat &c. Some of the Irritants act only on certain parts, as the

Arsenic & Mercury taken alternately with opium produce an eruption on the skin.

urine will not excite inflam: of the bladder, or mucous surface of the urethra, but will in any other part. Nor will bite excite Inflam. of the Liver, and some writers say that snake Poor & Syphilis Venus may be taken into the Stomach with impunity, but if applied to the surface after the removal of the cuticle, violent effects are sure to follow. The skin also in a great measure resists the attacks of certain noxious impressions. Cold is usually referred to Chemical Irritants, as chilblains after exposure, also Inflam. of the Brain, Liver, Lungs &c. This differs materially from the causes which have been mentioned as it is a sedative, & not a Stimulant and the effect produced by this exposure is in proportion to the reaction. 2d Internal Causes are numerous but their mode of action is unknown to us, in consequence of which they were called by the Ancients - Occult. But this we know, that arterial action cannot exist for any length of time without producing inflam: and other serious affections. Irritation in one organ will thro' sympathy produce it in others. Many other divisions besides those enumerated have been proposed and adopted by authors, such as Predisposing, Exciting, Direct and Indirect. By Predisposing or Indirect we are to understand the alteration of a part caused by some agent which renders it liable to be affected, but does not affect itself, as Cold, which may be applied to the general system. The Direct or Exciting are those which produce the disease itself. Remote & Proximate Causes are another division. By Remote you are to understand those causes which act directly on the

"Bichat says these parts have their life elevated" –

the parts. The Proximate is the first link in the chain, or that which being present the disease must exist / The late Pathologists have abandoned this division / Irritation is the Proximate cause of Inflam: Those previously mentioned as producing Irritat. are the Remote. the Organic nerve become affected by an impression made on

The Capillary vessels are the seat of Inflam: & in consequence the nerves, bloodvessels &c are also involved. The great question on which Physiologists differ, is whether they are in a state of Excitement or Exhaustion. As regards my own views I believe them to be in a state of high excitement and for the following reasons. 1st Because any stimulus has a much greater effect when a part is inflamed, than when in a healthy state, as an Inflam: eye cannot bear the light without considerable pain. 2dly Sensibility is much greater in parts comparatively insensible in health as Bones Tendons &c have that function much increased in an infla. state. 3rd The temperature is also greater, and heat is a vital action of the Bloodvessels. 4th High Arterial color can only arise from an increase of vitality, as the quicker the circulation the higher the colour; but the reverse of this is the case when the blood is stagnant, as in Gangrene from the effects of cold the parts are livid. 5th Sympathetic action is excited. 6th All the causes which increase the action are Stimulants or Irritants. 7th The consequences of Inflammation are the increase of a great quantity of new fluid, divided parts are united, and cavities filled up

Thinks called "Infl am" under action affects a healthy one.

by depositions, which lead us to believe that they depend on an increased excitement. 8th Gangrene is preceded by very violent symptoms, by great and continued excitement previous to its occurrence, this irritability and excitement subsides and it is owing to a subsidence of those that it does not take place. 9th In the treatment we must resort to exhausting and debilitating remedies to subdue it, if on the contrary we resort to Tonics, Stimulants &c, to give tone to the supposed weakness and debility we will aggravate, the disease, as is daily proved: from these reasons there can be little doubt but that the parts are excited. Another question has arisen among Pathologists whether Inflam. be a state of healthy excitement or not. This can be easily answered by comparing them to a state of excitement in a healthy person, by which pleasing sensations are induced, but the reverse is the case in Infl. In health natural and uninjurious fluids are secreted, but in Infl. they are unnatural as Pus, Synoph, &c. which is never secreted in a healthy part. Hence infl. may be defined to be a morbid excitement or altered action of the nerves and bloodvessels which depends upon something entirely unknown to us at present. The Lymphatics are also involved which when induced terminates in the secretion of new fluids, sometimes in Gangrene and Death. Hunter considered Inflamm. to be a morbid increased action; while Vacca on the contrary maintained that they were in an exhausted or diminished state. In this he has been

A disproportion between the powers or actions of the capillary vessels and the supplying vessels.

supported by Allen, Dabbott, Philip, Hastings & others. They supposed that their enlargement was passive and produced by the Vis a Tergo derived from the Heart and Arteries. Dr Philip supposed that there was a disproportion between the vis a tergo and the resistance of the vessels, and when Infl. takes place the vessels are stagnated. But we maintain that there is an increased action on which the distention or dilatation of the vessels depends but not owing to exhaustion. There is also a larger quantity of blood flowing thro' the arteries in Infl. than otherwise and that they are active and not passive. I give you the following illustrations 1st of the effects of Local Irritants, the puncture of a needle, or sting of a wasp, will be immediate: followed by Redness and Infl. (Philip supposes that contraction takes place first). The same phenomena are produced by the lodgment of a mote under the eyelid here the vessels instantly enlarge and tears are copiously secreted.

Heat also causes an enlargement and increased flow of fluids. The same is the case as respects Irritation on the Skin &c.

2d Internal Stimuli as Brandy, Wine, Ether, will increase the Circulation and cause enlargement of the Capillaries this cannot be owing to a Mechanical impulse, for in these cases the enlargement is often in an inverse ratio to the vis a tergo, as when the action of the Heart is violent the Capillaries are often undisturbed. In Blushing we find the face and neck suffused from the operation of certain passions, in all such cases the blush is only partial

if owing to the vis a tergo it would be universal. But this phenomenon is the result of nervous Irritation, and not of increased action of the Heart. 3rd In Infancy and Childhood the Vasc: action is in full action not only to replenish the various secretions and excretions so abundant in infancy but especially to furnish materials for growth. It is much greater than in adults, for then the phenomena of life are diminished to a certain degree and nutrition and secretion are lessened. The same may be observed of children while in disease compared to a state of health. 4th Whenever there is any new or increased demand made on any of the tissues or surfaces the Capillaries enlarge to meet it, as in the case of Children just mentioned. in the growth of Tumours, in the heads of Animals recovering their horns: in the organs of generation of female animals in heat, in erections of the penis &c. When there is an increased secretion from any part, it has the same effect also in the Uterus when impregnated. 5th Mr. Hodgson (on Diseases of Arteries P. 247) says that when the large arteries of a limb are secured, it is the minute ramification which first enlarge & afterwards the large, but even this in a very small degree, and in some cases not at all perceptible. 6th The Phenomena of Inft. under Fascia, mucous membrane, hardened cuticle, Periosteum &c, show that it is active not passive. As there is a powerful effort to distend the membrane made by the vessels, this must depend on an inherent power in the vessels themselves or a vis à tergo. As it regards the vis à tergo

it cannot be true, as the distention is not proportionate to the excitement of the heart and arteries: and in the next place if the swelling and tension was owing to the vis a tergo, the resistance of the Fascia &c, so far from aggravating ought to cure it by restoring the ~~resistance~~ equilibrium of between the resistance of the vessels and the vis a tergo, but instead of which it is increased and can only be cured by dividing the Fascia & Tendinous sheaths in a transverse direction, and thus relieving the pressure. 7th Inflam. is most severe in parts where there is most strength of skin, serous membrane, or near centre of circulation. 8th Inflam. can be excited on the skin by Sinapisms & Blisters, in Patients whose vital powers and actions are nearly exhausted. When the pulse cannot be felt and surface cold, as in Low Typhoid Fevers, great prostration &c, when the vis a tergo must be diminished and imperceptible in any way. 9th The veins of an inft. part and those going from it are enlarged, according to Doctor Philip the Capillaries are in a congested state and owing to their debility are nearly or quite in a stagnant condition and cannot empty their own cavities. If such be the case how are the veins enlarged? it can only be by an increased quantity of blood in the capillaries. 10th The Arteries going to an Inft. Part are also enlarged, If in was in consequence of the vis a tergo why does it not take place in parts that are paralyzed contused or otherwise debilitated? 11th They are not only enlarged but at the same time in a state of increased action, as is acknowledged by Dr. Philip himself

If there be an increased action there must be an increased circulation.

& as it is proved that the irritation commences in the capillaries and is sympathetically transmitted to the larger vessels (as confirmed by Dr. James & others) the same power must be allowed to the capillaries under the effect of irritation. (Philip's theory is that of increased action in the large vessels, and congestion in the capillaries) The action extends not only to the vessels of the surrounding parts, but of the whole body, & if this be owing to a vis a tergo what would be the effect in Inft. Fevers. The next question relates to the quantity of blood in an Inf. Part. This is owing to an enlargement of the capillaries. The velocity is also increased. For if not, the quantity must be diminished: in proof of these facts I need only mention that the color of an inf. part is much brighter than otherwise. When the motion is retarded the parts become dark and livid, as from exposure to cold in low Typhoid Fevers, from the application of Ligature, Bandages &c. The temperature also is increased as proved by experiments of Hunter, Cooper and others. If you make pressure on an inflam. part it becomes pale but as soon as it is removed the colour will return with great rapidity, when ~~to~~ made on parts that are torpid it returns very slowly. Incisions made in Inft. Parts are followed by profuse Hemorrhages which are difficult to be restrained. It is emitted not only in greater quantity but with greater impetus, and is much brighter. That larger quantities are carried to an inf. part is proved by the fulness, tension & pulsation of the supplying arteries.

As such is the case what becomes of the blood if it were stagnant in the capillaries as supposed by Philip and others. They would certainly burst or gangrene would shortly ensue. But the veins are also found enlarged, and in a greater proportion (Flome) than the arteries, and thus the inflam is subdued. Again if we apply a ligature and open a vein at an inflam. part we will find the blood resembling more an arterial color than in a state of health. It is also thrown out with much greater velocity. The abundant secretion of Serum, Lymph & Pus, as frequently observed, are also increased, also the reunion of divided parts, formation of new substances, which can only be produced by an increased quantity of blood in the parts.

These facts oppose the doctrine of diminished action as advocated by Philip & his cotemporaries, and, in my opinion, prove that the capillaries are actively engaged in transmitting that vital fluid which is essential not only to secretion and nutrition but also to reparation, & that they possess expansibility as well as contractility, and that both are modifications of the irritability of many modern Pathologists; that the Heart Arteries and Capillaries possess this property of dilating under the influence of their normal stimuli, but not from any vis a tergo.

The next question that engages our attention is the Progress and Terminations of Inflammation

The Terminations may be arranged under six heads

Inflam is caused by irritation produced a morbid excitement.

1st Delitescence. 2d Resolution 3d Secretion of Serum or restoration of the nat: secretion of the part. 4th Secretion of Fibrine or Coagul: Lymph. 5th Secretion of Pus and 6th Gangrene. By delitescence we mean a sudden ~~Inflam:~~ of cessation of the Inflam: as in Hernia Humoralis which will often disappear immediately by inducing a discharge from the Urethra. It also occurs under many different circumstances 1st As when the cause is removed. 2d When powerful sedatives or astringents are used, as a Burn is frequently cured by immediate immersion in Cold. 3d Powerful Counter irritants as Blisters, Mustard, Plasters &c as in Pleurisy & like diseases. 4 violent Inflam: in one organ will cure it in another, as two diseases cannot exist at one time (Hunter) the weaker giving way to the stronger. 4th Delitescence often occurs from violent inflammatory affections in one part, and settles in another as in Gout when removed from the ball of the great toe, generally settles on some internal organ, this translation is termed Metastasis & is frequently manifested in Chronic affections particularly when in bad Constitutions. This is very important to the Surgeon, as a knowledge of this fact will prevent his heating up old Ulcers and like diseases, as it will certainly be at the expense of the patient's health Constitution and perhaps life. 2d Termination is by Resolution, This is when the phenomena as Heat Pain, Swelling & Redness decline gradually and the organ

returns to its natural condition without any derangement. (It is said that the cessation of pain is the most favorable sign in this form) but Burns denies that this ever happens as there is always some secretion of some kind in every inflm. if not in the part itself at some distance. This is also my opinion — 3rd Term. is by a secretion of a serous fluid or a natural secretion of a part, as is seen in cellular membrane producing oedema and also in cavities. It is also frequently seen around inflam. parts. Dropsies are frequently the cause of it. This effusion is generally the result of a moderate degree of inflam: as in old persons or those who are intemperate. It is often favorable but when it occurs in the Brain, Thorax, Abdomen &c it is very dangerous.

4th This is a secretion of coagulating lymph or fibrine which is termed the adhesive stage. It resembles much the fibrine of the blood. It is said to vary in different tissues of the body, and it occurs very soon after Inf. has been established. Thompson says that if in 4 hours after the parts have been in apposition they are separated it will be found. It is the bond of union between all divided parts and very soon becomes organised. (Serum never becomes organised). It is called union by the first intention or the adhesive stage of Inflam: It always assumes the nature of the part injured, as in Bone it forms bone, in Skin, Skin. &c: The time required for the formation of vessels is very short, in good constitutions it will take place in 6

hours and becomes strong in 8, & in 24 it may be injected. The advantages arising from this effusion are innumerable, as by it divided parts are united, hemorrhages stopped, abscesses circumscribed, foreign bodies encysted and thus prevented from doing injury &c. Without it, we should be unable to account for any of the phenomena occurring after operat surgical. It occurs much more readily in some surfaces than in others, as the skin, cell: memb: &c: while in Bone, Tendon &c it is much longer; and in Mucous Mem. it is doubtful whether it ever occurs. It accumulates in Mucous Cavities as in the Oesophagus, Trachea &c, forming false membranes. Altho' some parts are more capable are more capable of adhesive inflam: than others, it occurs in every part of the body that is organised, mucous membranes excepted. It also occurs more readily in deep seated parts than in those more external (as the Infl. is not so violent). This deposition frequently occurs in the substance of a tissue, as well as on the surface, this is demonstrated in the formation of Callous edges to Ulcers also by their depositions, structures are formed, which being secreted in the substance and not from the surfaces of the parts It injures the parietes of the Tube by lessening its calibre, as in the Stomach, Intestines, Bladder, Urethra, It also occurs in parts of a Glandular Structure such as the Mammæ, Brain, Liver, Lungs, Testicle &c. This indication has been considered by some as a different and

distinct termination and termed Schirrus, Induration and Incarnation. Hepatization is sometimes used when the lungs are affected. Sometimes these Indurations remain permanent in consequence of their not being acted on by the absorbents but generally after the lapse of a certain period they are removed. They should always have time, as there are many cases of extirpation of the Mammæ, Testicle &c upon record being affected by Schirrus &c. To the disgrace of the Surgeon when time alone was sufficient for its removal.

Scabbing. When from slight wounds there is a small quantity of blood effused, it becomes hard, and forms a scab. by this the Inft. is rendered milder than if exposed to air. Lymph is effused under the part, and union goes on precisely analogous to those of other parts. They may be formed not only from dry blood, but also from Mucus, Pus &c. The same circumstances occur when parts heal under Court Plaster Gold. Beaters Skin &c. This termination is more favorable than any other & in many cases advantageous, even when it causes alteration of structure, it is preferable to those caused by suppuration, as the latter not only cause great suffering but at the same time very great deformity.

5th To that which arises from the secretion or deposition of Pus. When inflam. is very rapid and severe it transcends the adhesive stage, and terminates in the secretion of a peculiar fluid called Pus (This is called the suppurative stage of Inft.) The tendency of a part to suppuration is manifested

by certain phenomena, such as an aggravation of all the symptoms, the Redness assumes a brighter hue, swelling becomes of a conical form & Tension increased, Pain severe attended with Pulsation or throbbing. Its formation on the contrary is indicated by a subsidence of the symptoms, which sometimes takes place very rapidly, but the pulsation still continues. The tension is lessened and the part relaxed, the swelling becomes conical and soft, fluctuations are very perceptible, also a sensation of cold and shivering the skin becomes pale &c. When it is deeply seated as under the Fascia and the like the diagnosis is not so perceptible, and will require some experience to decide for here we have only to depend on the throbbing and Rigors, which are more indications of the formation of Pus. When it is formed in a good constitution and healthy part it has has been termed laudable or healthy. It is of a greenish yellow color resembling cream. When heated it has a peculiar odor, but entirely without smell when cold. It is heavier than water, putrifies slowly and found to consist of small globules floating in a thin watery or serous fluid which may be coagulated by the Muriate of Ammonia. Its properties are mild and uninvitating and do not corrode unless exposed to the air, as we see parts over which it passes frequently excoriated, while the surface from which it exudes is healthy. But these properties vary in all diseases according to the organ, part, or tissue in which it is situated. The constitution also has much effect

as well as the violence of the Inft. When slow the pus is thin with flakes of lymph; & when it is very violent and active, it is found watery, very often acrid and mixed with globules of blood. In such cases it putrifies very readily. This has been termed Sanies or Ichor. It also varies according to the tissue as in the Liver it resembles Bile. Pus was formerly supposed to be owing to a breaking down, or from a dissolution of the soft parts. But this doctrine has long since been exploded and since the year 1743, it has been taught by Hunter that it was a secretion. In proof of its being independent of a solution of continuity we have only to observe its formation from the Tunica Conjunctiva in Inft. of that organ, also in Bronchiæ. Urethra &c, and many other surfaces as Pleura, Thorax, Peritoneum. or the skin where the cuticle has been removed by burn or blister. All organs do not secrete pus equally: as in mucous memb: it may easily be adduced. But it requires long violent and continued Inft. before it will occur in a Serous Tissue; as a bougie (Hunter) introduced into the Urethra will cause it to take place in 5 hours, but in Cellular, Memb: it requires 12 or 14 hours before it will be produced.

Formation of Abscesses. In this there is an inflammation of the adhesive Mind in the Cell: Tissue by which the cells and cavities are filled with Lymph. The Inft: continuing pus is formed, and is then termed Phlegmonous. The matter is generally formed in the centre, & by its pressure

affects the absorbents which form a cavity for its reception. The all. membr. immediately around the part is rendered dense by the deposition of coagulable lymph, which also forms a cyst or membrane lining the cavity, which by an increased secretion of matter continues to increase in size (in this case we have both absorbent and Lymphatic Irritation).
Sometimes this enlargement does not occur, and the absorbents remove the matter as fast as it is formed, & many cases faster, as we frequently see abscesses removed in this way, it is then said to be discussed: by which nothing more is meant, than a removal of the matter by the absorbents, in which case the sides of the abscess are enabled to contract & the parts to assume their natural state. In other cases where the secretion is greater than the absorption, the enlargement takes place from all sides of the cavity, but mostly from that next the surface, by which the parts are rendered thin (This also shews that Pus has no corroding power as was formerly supposed). This has been termed Interstitial absorption. But Mr. Hunter says that there is another, which he calls relaxation, and compares it to that which takes place in the Genital organs during labour.
Progressive or Ulcerative absorption is where there is a removal of the parts or a solution of continuity. When by relaxation & absorption abscesses arrive at the surface, at which time an opening is made by rupturing the cuticle, & the opening

continuing to enlarge forms an ulcer: and it then takes the name of Ulcerative Infl. which also has been regarded as one of the Terminations of Infl. but this is not the case and it can only be considered as a consequence. It occurs more readily in parts that are pressed upon, but is not always produced by pressure as it is the product of abscesses when pressure does not exist: nor is its rapidity entirely owing to this cause. Ulceration is always dependant upon infl. and is preceded by the effusion of coagul: lymph as in abscesses, aneurisms &c. the cell: tissue is always altered to prevent the discharge of the fluids. If this adhesive infl. does not take place dangerous consequences would often result, until lately it was supposed that ulceration was always preceded by suppuration; tho' this is generally the case it is not always as an instance we may mention Aneurisms.

Symptoms. When it is superficial we find it enlarging in size; the edges irregular and excavated, the pain is severe lancinating and of a gnawing kind. The constitution suffers much in many instances (It is then termed Phlegmonous or Corroding ~~Ulcers~~ Ulcer). It occurs much more readily in some tissues than in others: under Fascise &c it is very tedious and travels for some distance under them. It is more liable to attack newly formed parts, such as cicatrices tumours &c than those that have existed longer. Sometimes the Ulcerative process advances so rapidly that adhesive inflam: cannot take place, in such cases frightful consequences

are the result, as may be frequently seen in opening of cavities arteries &c. But in other cases it is found very advantageous in facilitating the removal of foreign bodies, destroying Tumours, seperating dead from living parts, opening abscesses &c. The Cellular & Adipose Tissues suffer most. Inflam. not only destroys but also regenerates parts, as in the formation of Granulations. In this process the sides of the cavity throw out a layer of coagulating lymph which very soon becomes organised and has its surface covered with small convex bodies like granules. They are very vascular formed of a net work of vessels and nerves, and from the absorbents entering into their composition they are easily destroyed. Granulations when healthy are small conical bodies of a bright arterial color, very delicate, secretous, & vary with every form of the constitution. Sir A. Cooper says that they secrete fibrine & in this way layer after layer is formed until the cavity is filled. It is not every suppurating surface that can granulate, as it does not take place in mucous or serous membr: in fact they cannot be formed unless there be a solution of continuity.

Granulations possess two manifest properties: the 1st is the power they have of strongly uniting together, supposed by Hunter to be by a direct cohesion of its vessels. While Thompson & Cooper believe it to be by the effusion of lymph. Whenever union takes place by the formation of Granulations it is called Union by the Second Intention.

it has also been termed Incamation or union by the formation of new flesh. The 2d Property is its power of Contraction so as to diminish the part affected in this way a large ulcer is often diminished 1/3 or 1/2 of its size, before any new skin is formed unless it situated on such parts as will prevent this power from taking place, as on the Cranium Tibia & other bony surfaces. This contraction arises from the parts becoming condensed, by which the vessels are made smaller, and in this way the parts are drawn together. From this very great advantages result, as by it ulcers are rendered much smaller and consequently much less new skin will be required to cover them. The sides of the cavity are also approximated to a certain degree and less new matter is required to fill it. But occasionally great disadvantages result, for in some cases after a part has been completely covered over with the skin the part continues to contract, and by this means great deformity is induced as in the case where abscesses have been formed in the hand, which in consequence of this contraction has the fingers drawn together. The same occurs in the face, producing great distortion.

Abscesses have but little disposition to granulate until they are relieved from pressure, produced by the contained matter, but as soon as this is removed the ulceration is suspended and the parts very soon contract and fill up. The Granulations form more readily at the bottom of the cavity than any other parts, in some cases it is necessary to detach the skin entirely. Abscesses then may be said to be diminished by two circum-

stance. 1st By a filling up with Granulations. 2d By their adhering together and contracting. Generally, whenever Granulations fill up a cavity they assume the nature of a part injured: but this is not always the case especially as it regards muscles, cartilages &c. as in the first the parts are united by a kind of Tendon in the second by Bone. After the part is filled up we see nothing but a small ulcer at its mouth, which soon becomes filled up, and instead of the edges being undermined as in the first instance, they will be found tapering and covered with a thin white substance called a Cicatrix.

Sometime, this Cicatrization commences in the centre by small spots, but Mr. Cooper believes that new skin can only be formed by Granulations, from the old, Hence the reason that they are always formed at the edges of the Ulcer. The Cicatrix when first formed is very vascular, but if it exist for any length of time, the vessels are contracted it becomes less florid, thinner, whiter, and more delicate. it is also depressed below the surface, and finally takes on more of a ligamentous character at length by examination we will find the cuticle and rete mucosum regenerated. But should the cicatrix be so situated as to become fixed it will still continue to diminish by the formation of new skin.

Different circumstances may prevent or delay the cure. In the first place, the opening may be too small, by which the matter will continue to press on the cavity, & prevent Granulations.

and destructive in its consequences. When from any cause it has not ended in either termination and is about to assume a Gangrenous form we find inflam: and pain considerably augmented, the infl: being very much extended and in a short time we shall perceive a change of color in the part which alters from a bright arterial color to a white and afterwards livid or venous hue. then the heat becomes less, and the part cold; but the pain still continues while the circulation becomes slow accompanied by effusion in the cell: membr: & the skin forming blood blister termed . The Infl: having subsided the parts become soft and flaccid, after which it is termed Gangrene in which the powers of vitality are much diminished

But this state cannot exist for any length of time for unless it is soon diminished, it becomes perfectly black cold, soft, insensible and sometimes crepitation (which arises from an effusion of gas into the cell: membr.) and the circulation entirely diminished. This state is termed Sphacelus, in which the vital properties are quite lost.

The distinction between Sphacelus and Gangrene is maintained by many authors and denied by others, for my own part I think it essentially necessary. By Gangrene then we mean that state where recovery is possible & where the vital functions are diminished to a certain degree but not entirely gone, or in other words, the part may be said to be in a dying state.

Pulse sometimes full: the gaseous pulse of Dr Rush as if it contained air.

On the contrary in Sphacelus the functions are entirely lost & the part is actually dead. Both these states should be distinguished from Asphyxia or apparent death which is generally caused by a blow or drowning. The part or patient become pale, cold &c, and there is quite a suspension of the circulation, but after a short time it will return if properly treated; this is owing to a certain degree of irritability which remains and by proper application the patient or part is resuscitated. From this we may infer that after Inflam. has been aggravated and the Phenomena of life manifested with great violence, that Gangrene occurs and finally terminates in Sphacelus, after which the blood become coagulated not only in the capillaries, but also in the supplying vessels. This circumstance accounts for the little hemorrhage following incisions, amputations &c in the mortified part. In most cases putrefactive fermentation gives rise very readily to a very fœtid odor, injurious to the patient and his attendants. There is generally very great constitutional irritation, but very soon the violent symptoms of Inflam. Fever begin to disappear, and a sinking condition is apparent, the pulse becomes quick small & thready. The skin which was at first hot becomes dry & contracted, the tongue is also dry and covered, as well as the teeth, with sordes, great restlessness, jactitations depression of spirits, delirium, wildness of eye, Subsultus Tendinum

hiccough, cold sweats &c, and unless soon relieved the patient dies comatose. Tuesday, May 10. '31

These symptoms do not arise from sympathy as has been supposed (as it is impossible for living matter to sympathize with dead) but by absorption of the putrid matter, as proved by the experiments of Gaspard & Magendie, who injected putrid matter into the veins of healthy animals with precisely the same effect. — The question whether Inflam. produces Gangrene by its peculiar action, or by its violence has led to much discussion. But according to my views it is produced by both causes. In proof of the nature of Inflam. has great influence in causing Gangrene we have only to examine the common Furuncles or Boil in which we always see the cellul: membr. sloughing out, which is generally known by the name of Core. The same is the case in Small Pox, also by the malignancy of animal or veget: poisons (Boger) putrid fevers & Hospital Gangrene the latter of which arises from some peculiar action or state of the Constitution (call them act by their particular nature). But the violence of the Inflam. it must be confessed is the most common cause, and this violence may be in proportion to the strength of the part or activity of the Inflam. as a moderate degree of inflam. in a weak part is said to be violent, while on the contrary in a strong part the symptoms must be very

violent to produce bad effects, consequently it must arise from the severity of the Inft. or weakness of the parts hence it may be said that there is a disproportion, between the activity of the Inft. and the strength of the parts the organic action is too strong for the part.

Every tissue of the body is endowed with a certain degree of strength which cannot be excited beyond certain limits without serious consequences arising. In the first place it may be said that Gangrene — with result from mere increased action of inflammation and unusual continuance of the same tho' the part was strong when at first attacked. It may be caused by improper treatment & kept up by the cause remaining: as if Urine be extravasated in any of the tissues it will not only excite inft: but it will be kept up as long as its irritability will bear it or until the part is quite exhausted. The same is the case in violent Inft. of the viscera as the parts cannot bear so much excessive action. Stimulating remedies will sometimes cause it. A full plethoric habit may be considered to predispose to Inft. & Gangrene. 2d In weak parts as Bone, Tendon, Ligament, Cell: Memb. &c Gangrene is more apt to occur than in parts possessing more vitality, as in them it will frequently arise from causes that would only excite the other parts to a certain degree hence we say that they are naturally weak. The same is the case in parts debilitated from Contusions Cold &c

as they will rot under the stimulus of their own arterial blood. This phenomenon occurs also in tumours and newly formed parts. This stage has been by Thompson termed Sanguinous Inflam: and when abscesses form they are called Sanguinous abscesses. In many such cases we will be able to draw away thro' the opening the cellular web: which very much resembles Wet Tow.

Gangrene is frequently arrested by the adhes. stage of Inft. and the parts become hard from the effusion of lymph, which is generally attended with much inconvenience, and in Vital Organs, Death is not unfrequently the result. It will also occur in persons whose constitution are worn out by any chronic disease, from slight causes: and we not unfrequently see it occur in those who have suffered from constitutional affections as Scrofula, white swellings &c. In the latter it is of frequent occurrence and attacks the stump after amputation. The same is the case in Hectic, Malignant and Typhus Fevers from the mere application of blisters. This not unfrequently arises also in old tropical patients, hence when parts are weak from accident, age, or state of constitution we must be cautious not to induce action too violent for the System, to this we may add that Gangrene is caused by a very excited or depressed state of the System.

Consequences of Mortification. After mortification has occurred the dead part is to be regarded as a foreign substance simply having a mechanical union or connexion with the

surrounding parts by its vessels. But the adjoining parts very soon become contaminated and mortify also. and in this way we not unfrequently see the whole limb removed. This arises in the 1st place from the original inflm: leaving the parts surrounding the slough in a weak state: 2d from the sedative influence produced by the mortified part, which renders the bound part incapable of bearing the stimulus of its own arterial blood, & the mechanical irritation of the slough. In this way the disease extends until it comes to a part sufficiently strong to withstand its influence, This condition of the part is generally aggravated by a bad state of the general system arising from the absorption of putrid matter. But sometimes the mortification is arrested by the dead parts acting as a mechanical irritant thereby causing inflm: which is first seen in the form of a red line, but is soon followed by a secretion of serum causing a blister. Lymphatic irritation is next induced and the dead parts are separated by ulcerative absorption. After the part is removed, the stump suppurates for a short time, granulations are thrown out & the parts heal in the natural way. Lymphatic irritation is seen in every organised part, and is of itself sufficient to remove a whole limb, provided the constitution can bear it. The line of separation will vary in the different tissues according to their degree of strength, as the weaker the part the higher the slough will extend. This is very well exemplified in skin, muscles, arteries, veins, nerves &c

in which it will cause them to divide as if by the knife while in Bone, Tendon, Fascia, Ligament Cell: Membs: it will extend to a greater distance above the part hence we may, that parts divide in proportion to the degree of vitality they possess.

Sphacelus may be induced by many other causes than those mentioned, and has been treated of under 2 heads: viz: As occurring with or without inflam: The 1st of that arising from inflam: we have treated of already, and I shall now mention only such as occur without it.

They are called either External or Internal, The external is again divided into Chemical and Mechanical. The 1st Chemical are those by which the vital properties are destroyed by their activity and before Inff: is induced among them we may mention Caustics, Acids, Actual Cautery, Vegt: Min: and Animal Poisons: &c against all of which the vital parts resist: but are instantly over come and the part at once destroyed. 2d the Mechanical are such as Contusions, Gun Shot Wounds, Pressure &c, the latter of which may produce it at once when so violent as to prevent the whole circulation, both venous and Arterial, as frequently happens to persons who have been confined to bed for a long time 2d from pressure merely on the veins allowing the Arter: Circul: to go on, as in the application of Bandages which first cause tumefaction and afterwards mortification. It also occurs in Strangulated Hernia. 3rd Pressure on the Arteries alone will cause it as proved by

the application of a ligature upon the main artery of a limb. It is also produced by pressure from Tumours. Besides those mentioned it is supposed to arise from a diseased condition of the Heart and Arteries. Hodgson says that it is owing to a suspension of the capillary circulation (doubted by many)

Of the Internal Causes we know but very little, as a general rule however we call all those internal, when we cannot detect any injurious or external agent to which we can satisfactorily ascribe it. This form is generally designated by the term Idiopathic, which is supposed to arise from the exhibition of some deleterious articles as Ergot &c. Mr Ferrier relates many cases of its being produced by the exhibition of Ergot to healthy animals. It has also been ascribed to an ossification of the arteries: to a coagulation of blood in them: or some other mechanical obstruction. When mortification of this kind is induced it is very liable to spread considerably beyond the place of its commencement: as proved by the applic: of a ligature to the main artery of a limb; the parts below being deprived of blood soon mortify which will in a very short time extend to those parts above from which the blood has not been taken. This condition is very much facilitated by the weakness of the part as well as constitution.

The Prognosis in many cases is owing to or depends on some constitutional irritation. In Plethoric persons a whole limb is not unfrequently removed, generally however the adhesive

inflam: arrests the mortification after which a cure takes place.
The causes that produce this disease in some cases act very rapidly in others very slowly which circumstance has given rise to the division of Acute and Chronic or Humid & Dry.

By Acute or Humid we mean that species in which a part mortifies so rapidly that the blood is not absorbed, consequently the part remains moist, putrefaction occurs very readily (hence the danger) in this form attended with more or less constitutional affection. On the contrary it is termed Chronic or Dry when this process goes on slowly, and the phenomena gradually diminish by which the fluids are absorbed, and the parts become quite dry and very black resembling an anat: preparation in which no putrefaction occurs and is unattended by constitutional irritation. At slow ulceration finally occurs which gradually detaches the part. The causes of this form are not generally known. Gibson relates a case which he supposed produced by fracture, and Boyer one produced by tight Bandage. (Pott's Gangrene or that which he describes as taking place in old persons is the same as that produced by Ergot.) They differ but little in appearance and give rise to the same phenomena. The Humid or Moist is the most dangerous, and will frequently be found to produce death. When Dry the part acts simply as a mechanical irritant and will soon destroy

the part itself only. Friday May 13. '31.

Treatment of Inflammation. In the treat: of Inflam: we must first examine the cause, after which decide which termination is most desirable and how it is to be accomplished. We should also determine whether the cause be Internal or External, Mechanical or Chemical, and whether it is still acting or not. If it is we should remove it as soon as possible, ~~by~~: when mechanical, such as a foreign body lodged, we should remove it soon as possible by making incisions for that purpose, and tho' the incision itself will cause Inflam: yet it is preferable to the cause remaining. Pressure in many instances will cause it, and must be removed by dividing Fascia, Structures, and loosening Bandages, removing splints, opening abscesses, removing Tumors &c. The Chemical causes are not so easily managed but much may be done to mitigate its violence. If there is extravasation of Urine make free incisions and let it out. or if an alkali has been applied it may be neutralized by an acid, and vice versa.

If the cause should be internal regulate the excitement here we will find Emetics and Cathartics very useful, and in many cases will remove the cause (an emetic often causes the Exanthemata). It often happens however that after the cause is removed the Inflam: does not subside. In such cases the Surgeon must decide at once what termination

is most desirable. Generally Resolution will be found so, as in burns: but when the cause is internal there is danger of metastasis. But sometimes suppuration is better. In external Inft: as on the extremities &c a serous effusion is less injurious than an adhesive one, but when internal the adhes: is much better than the serous, as they will cause dropsy which is very dangerous particularly in the Chest. It is much better in such cases to have the sides of the pleura adhere together, than to have the water floating about in the cavity. So also in Incised Wounds the effusion of lymph is much more desirable than any other. In some cases however we cannot avoid suppuration & in fact it is absolutely necessary in Carbuncles, Gun Shot wounds, Sphacelus, &c. And when this is the case no time should be lost but it should be promoted, so that the slough may be detached as soon as possible. The liability of part to terminate in Sphacelus & Gangrene should be resisted by all the means the Surgeon has in his power, tho' it is useful ~~of useful~~ in some cases by removing tumors &c. He should also recollect that owing to certain degrees of Inft: certain stages of Inft: are liable to occur (as mentioned when treating of different terminations). Hence to accomplish any desired termination he should regulate the degree of excitement by such means as will prevent the Inft: from being either too violent or too weak. Generally it is too violent and should be reduced by the antiphlogistic remedies.

The General, calculated to reduce the sympathetic excitement of the system.

Its rapide and sudden abstraction operates =

sometimes however in old and debilitated persons it is too weak in such cases we must give a generous diet. Tonics, & even general and local stimulants as in cases of Fracture to keep up Inflam: sufficient for the cure. But as a general rule we must be prepared to moderate the general and local symptoms by lessening the excitement of the system.

1st. of the General. In Inflam. Fever there is an increased excitement of the Arterial and Nervous Systems, and suppressed secretions, in which the first object is to moderate action and restore secretions. To accomplish this we must resort to V.S. This operates 1st by diminishing nervous excitement as manifested by diminished action sensibility and irritability, and by a disposition to syncope. 2d it lessens the excitement of the vascular system, which may be known by the pulse being lessened (compression of capillaries) diminished heat &c. 3rd The nervous and vascular excitement being diminished it is accompanied by a restoration of the secretions, which is ascertained by the Tongue becoming moist, thirst lessened, and bowels and Kidneys open. The 4th effect is that of revulsion which determines the blood from the part affected, and drives it to that from which it is flowing. As when a vent is opened a larger quantity of this fluid is determined to this opening and if copious a diminution of it takes place in other parts, hence the quantity sent to an inflamed part is lessened as well as its momentum. In this way we are not unfrequently enabled to save a patient's life who is attacked with Hæmoptysis

by opening a vein which may determine the blood from the Lungs.
5th by a diminution of plethora or a preternatural quantity of blood in the system. (Females from a suppression of the menses are affected with this). But there is also an internal plethora as manifested by pressure and fulness about the chest and head, but still the capillaries are not distended and the surface is generally pale. From these circumstances we will see that the advantages arising from V.S. either local or general are very great, and it is much more advantageous when extracted rapidly. Some doubt this and say small and repeated bleedings are preferable but as our object is to diminish the action of the nervous and vascular system we should bleed until a decided effect is produced by which we prepare the system for other remedies. We should extract a large quantity in an erect position until syncope sometimes. But should they be small and repeated the patient feels no relief from the loss nor is the system prepared for other remedies. Besides which the inflam.d symptoms are generally aggravated owing to the weakness of the Patient by the loss of blood, without diminishing and even aggravating the irritability. Sometimes after repeated bleedings in chronic cases we will find a hot skin, full pulse &c which indicates the loss of blood, but if taken the patient sinks: such cases must carefully be distinguished. The quantity taken must be regulated by the effect it produces: the best indication is a cessation of pain, with a soft and

"Sometimes the firmness of the coagulum is lost and the buffy coat still remains; T.S. has then been carried far enough". (Thomson)

compressible pulse; the depressed pulse must not here deceive; the extent to which it should be carried must be regulated, when there is a restoration of the secretions and disposition to syncope &c it has been carried far enough. Also by the violence of the inflamed part: strength of the patient & habits, a knowledge of the prevailing epidemic, but especially by the nature of the injury, as when it is likely to continue long or be attended by free suppuration we must be cautious not to bleed too much or we will exhaust the patient in such a way that recovery cannot take place. As to repetition we must decide by the phenomena presented, as return of pain with the other symptoms call for it again, but be not deceived by pain: be careful it is not a nervous affection as here it would do no good. Sizy Blood also indicates a repetition (also if there is infl. in a delicate organ as the eye &c; but when the blood becomes pale thin and watery it has been carried far enough. 2d Purgatives will also be found useful. 1st by evacuating the hardened faces, which cause a very great degree of irritation. 2d by restoring the suppressed secretions of the Alimen. Canal, Pancreas, Liver &c (to produce their peculiar secretion we must resort to such purgatives as act on the viscera). 3rd They operate by lessening Plethora as by them a part of serum is sometimes discharged (A. Cooper). In this way they prostrate the system almost as much as the lancet, and is often substituted for it in moderate cases of fever. But they will no do when the infl. is violent. 4th Purgatives have

sometimes powerful influence as counter-irritants by determining to the Intestines, and relieving the Brain & other organs.

3rd Nauseating Articles. such as Tart. Emet & Ipecac. will be found very useful. They have a powerful influence on the nervous and vascular system, by the great sympathy that exists between them and the stomach. They subdue very much the excitement of the Viscera in Fevers, and may be carried so far as to produce syncope & even Death.

4th Diaphoretics. such as the Emetic & Saline articles, Citrate of Potash, Dovers Powders &c. in small doses will be found very useful. They may be also assisted by delicent drinks, pediluvia, warm bath, fomentations &c. opium may sometimes be combined with the internal remedies with great advantage. They act as direct evacuants by promoting perspiration and as revulsants by determining the blood to the surface. The bath should be from 92° to 90°.

5th Refrigerants. as Nitre and the Saline Preparations in addition to their supposed action of cooling the secretions they are said to operate directly in diminishing the increased action, and are only resorted to in Fevers.

6th Cold also to a certain degree may modify the symptoms. such as cold air, cold drink & few bed clothes. But it is still doubtful how far effusions, immersion, &c can be carried or when they can be used with safety. I think that in those Fevers termed Idiopathic, and in affections of the Brain great benefit will result from their use (Currie)

The French school however have lately introduced them in the Inf. of all the viscera except the chest, where they are prejudicial.

7th Narcotics, in the view of diminishing pain and nervous excitement. the best of which is Opium. It has a sedative influence on the nerves while it excites the heart and arteries. Some condemn it in Fevers while others recommend it in place of the Lancet. But as general rule it must not be used while there is active Inflam: But if there is severe pain and the nervous symptoms and irritability predominate it is very good. On the contrary if there is vascular action or excitement, V. S. is to be used as a preventive. 8th By diminishing irritation & finally inflam: as on it all local inflam: depends as well as Inf. Fevers. It is also useful when exhibited after operations and injuries. Much advantage is obtained from its combination with Neutral Salts, the Antimonials and other Emetic Substances. By these means we facilitate the return and increase the quantity of the Secretions by which the bad effects arising from its stimulating action are counteracted.

8th Sometimes the Inf. Fever continues with great violence and cannot be suppressed. In this case the Physician after having exhausted all the remedies mentioned has only one resource which is Mercury. This is a universal stimulant to all the secreting surfaces, as well as the absorbents and by this universal effect which is produced

It causes an equilibrium of the vascular and nervous excitement. It determines the blood to the parts that have too little and relieves those that have too much. It must be given in small doses.

9th Diet. Tho' all these means be employed they will prove of little advantage, without a strict attention to diet. In violent cases the patient should only be allowed mucilaginous drinks, cold and slightly acidulated. but in more moderate cases small quantities of farinaceous articles may be given with advantage. Low diet has the effect of lessening the irritability; but if he be kept too long without food the irritability of the stomach and system generally will be much augmented, and life with difficulty maintained (tho' it is sometimes necessary to give some food to keep up the tone of the stomach) particularly if he is of a nervous temperament. Females commonly require a more stimulating diet than males. By such means then we remove the Sympathetic and Inflamd Fevers but the local Inflam. when severe will continue after the Inflam. Fever is subdued and must be lessened by Topical Remedies, with which we must commence before the Inflam. Fever has entirely disappeared. The most efficacious is Local Bleeding. which may be performed by Cups, Leeches, or Scarification. The Modus Operandi of this form of Bleeding is similar to that of General V.S. hence the same effect which V.S produces on the whole system is produced by Local Bleeding from the part itself. When blood is taken

directly from an inflamed part, its effects are more evident as the turgescence is relieved by evacuating the vessels themselves, and when it is taken from the neighboring part it does good by evacuating the supplying vessels, also by revulsion and counter-irritation. Leeches are superior when blood is to be drawn from an inflamed surface and in all delicate parts. Cups are very good in deep seated Inflam. Scarification is but seldom resorted to, and tho' we may sometimes do good by dividing a large vein particularly on the Scrotum or Eye, yet it is not often productive of much advantage. 2d The local application of Cold has a direct influence in diminishing irritability sensibility, sanguine irritation and augmented temperature. hence it must not be too great or too long continued, or we will destroy all power, the part must be kept nearly at the Natural Standard (Burns). Powdered Ice, Alcohol & Water, & Ether &c are used for the purpose. It generally affords immediate relief, and if there is any danger of metastasis as in the exanthematous, Gout, Rheumatism &c it must not be used, nor in parts where suppuration is required. 3rd Cold is generally assisted by the astringent and sedative articles such as Salt, Sugar of Lead, Sal. Ammoniac, Cicuta. 4th The symptoms are sometimes modified by Heat also particularly when combined with moisture (This seems a Paradox in using both Heat and Cold) But when warm fomentations or Poultices are applied to an infl. skin

the secretions are increased: perspir. is facilitated, suppuration promoted &c. hence they are required when suppuration is demanded, and by determining to the part causes its reappearance when suppressed, particularly in the mucous tissues as in the Gonorrhea. (The increased action the part which is caused by their application is counterbalanced by the secretions produced) Hot applications relieve the pain by softening the cuticle and when applied to deep seated parts act on the principle of Revulsion and Counter Irritation, by increasing the determination to the part at which it is applied and promoting resolution. 5th Local Inflam: may be lessened by stimulating Friction, Rubefacients, Blisters, Setons and Issues which operate on the principle "that two Inflams. exist with difficulty at the same time" hence they are very valuable particularly in deep seated Inflam. They are also applied to the feet, when the head is affected, and to such parts as act by sympathy, as we frequently apply them to the Breasts in Inf. of the Uterus, and to the same part after parturition, to promote the secretion of milk: behind the ears in ophthalmia. Rubefacients are preferable when they are required to act immediately. Blisters should be used in Local Acute Inflams. They operate slower and produce a secretion of serum, tho' the general effect is the same. Setons and Issues are more lasting and keep up their impression for a long time, and are used in Chronic cases. As a general rule, we should never employ a counter-irritant

when there is great arterial excitement, as in such cases they will be apt to destroy life. In Low Protracted Fevers be cautious in selecting your excitants as well as the place for their application, for when Blisters and Sinapisms are applied to the extremities in cases of great prostration the parts will be apt to become Gangrenous, which they would prove useful on the body and not be productive of mischief. 5th Local Inft. may be relieved by the direct application of Stimuli as dry heat, Spt. of Turpentine, Blisters Alcohol, Camphor, Hot Vinegar &c. As two stimuli make the same impression on the living tissue; hence the inflam. caused by one stimulus is cured by another. They act by inducing a new action or state in the condition of the system as Spt. Turpent. will cure a burn; a Blister, Erysipelas &c. They will also be found useful in Inft. affections of the Mucous tissue, as in the eye, throat, stomach, urethra &c. The direct application of stimuli will be found very useful injurious in violent cases of inflam. but are very useful when the symptoms are modified or the action in some measure reduced, applied in the first case they would hasten the Inflam. and dispose it to terminate in Gangrene. Many of the Stimuli as Ether, Alcohol, Spts of Camphor &c are useful by the cold which is produced their evaporation consequently when we wish such articles to act as stimulants they should be covered with Oiled Silk or some such substance to prevent evaporation.

7th The efficacy of the remedies mentioned will be increased by keeping the part at rest and also by elevating the part so as to prevent the blood ~~the~~ from entering it and to facilitate its return, by which means we produce as good an effect as if we were to resort to Topical Bleeding. If Irritants will not do good they will do harm, and this must be remembered when they are applied to mucous surfaces.

Tuesday May 17

Consequences of Inflam: First of Delitescence. In some cases by producing this termination we cause metastasis, by which the Inft. is transferred to a more important organ, in such cases the first indication is to excite the original inflam. provided it was not in an important organ, and if it was we must induce it into one from which least danger is liable to ensue, this may be done by Rubefacients: Blisters, Hot Water &c. When it is produced by suppressed secretions, as where Setons & Ulcers have been dried up use Hot Fomentations and Poultices. When from a fistulous opening becoming dry or from a suppression of the discharge in Gonorrhea producing Hernia Humoralis we should resort to stimulating injections. In cases of eruptions &c receding from the skin we must resort to means calculated to act on the whole surface as the warm Bath. Stimulating friction, dry heat as a sand bath &c. When we have spasms of the stomach, lungs, produced by metastasis depleting remedies must be resorted to. When it arises from vascular

irritation are V.S. and when from nervous irritation narcotics.
2d When Inflam. terminates by the effusion of Lymph in any of the cavities or tissues it is productive of much mischief. The treatment in such cases after inflam. has disappeared must consist of such remedies as will produce absorption: if internal by cold, friction, astringent applications, elevated position &c and well regulated pressure, but when internal, medical means must be resorted to as V.S. Cathartics, Diaphoretics, Mercury &c When these fail the Surgeon must evacuate the fluid by puncturing. Sometimes he is called to prevent its recurrence. this is effected by producing a more active inflam. in the part affected, which causes effusion of lymph or pus and thus forms adhesions, as in the Tunica Vaginalis Testis, by injecting wine & water or interposing a dossil of lint.
3d Adhesive Inflam: this is sometimes productive of disadvantage, from the too free deposition of lymph, as may be seen in Stricture, callous edges of Ulcers, Fistula Opacity of Cornea, Scirrhous Glands. and hence the leading indication is to promote absorption, but here it is more difficult than in cases of Lymph, as it very soon becomes organised, yet its removal is very desirable for it may lay the foundation for Cancer, &c. The means mentioned under the head of Lymph will be found useful, they consist of evacuating or exhausting remedies.
Experience proves that absorption goes on more rapidly in emaciated persons, and in those whose system is reduced, than

The French say, they have succeeded, by abstinence, in removing incipient cancer.

any others. New formed parts are also more liable to be removed than ~~any~~ those of long standing. Copious V.S. Emetics occasionally, Cathartics particularly mercurial and Diaphoretics must be resorted to, with an entire abstinence from food (Porter allowed only 6 pints of Seed Water in 24 hrs for 50 or 60 days together) assisted by Cups on Leeches with great advantage.

The remedies mentioned are assisted by local depletion and elevated position. When External, cold applications. Stimulating liniments and Plasters, continued application of Blisters &c. In the application of such remedies be careful not to increase vascular action, or we shall do mischief. As a last resource we must give Mercury, first as a Cathartic and afterwards in small doses until an impression is made on the system. By such means frequently we are enabled to discuss large Schirrous Glands and indurated organs &c. Yet it is dangerous and requires discrimination as to the length to which the practice can be carried, as it may be followed by sudden relapses and Death, and in some cases the Brain & Stomach become affected, by which a set of Nervous Symptoms are produced which illy compensate the patient for the cure. Other remedies have been recommended as Cicuta, but its efficacy is much doubted, ~~but~~ and at present it is little used. Iodine is much recommended in such cases in deserves most credit. Happily, however, all these remedies

Rough friction in stiffness of joints sometimes useful.

are not usually required as cautions edges of Ulcers, thickness stiff Joints, Opacity of Cornea, &c may often be cured by the judicious use of pressure, position, motion and the knife, and they should not be resorted to while there is Inf. remaining. Electricity has also been highly spoken of.
4th The next stage is the suppurative. When it is seen that Inflt: cannot be subdued, the means should at once be abandoned, and applications calculated to promote suppuration substituted. For this purpose the degree of Inf. must be regulated when too Great, depletes: when too low use Tonics and a generous diet. In all external affections we must apply, Poultices, Fomentations &c, as nothing is superior to Heat combined with moisture. They are serviceable by softening the cuticle, promoting perspiration: lessening the pressure, by which the part swells and determines to the surface. The degree of heat must be regulated by the patients' sensations, but they should be warm and kept moist, hence the utility of covering them with oiled silk and mixing animal oils with them, and to prevent their becoming dry, they should be of proper thickness or frequently changed. Medicated Poultices, and fomentations were formerly much used but at present abandoned, however pain may sometimes be lessened by sprinkling powdered Opium, Cicuta &c on the part, sometimes pulv: Flaxseed. Electricity is said by Abernethy to facilitate the formation of pus: it may be useful in deep seated Inf. where

Poultices &c would have but little effect. By these means we promote suppuration, and form abscesses which gradually approach the surface. Its progress may be facilitated by the application of Stimulants, as Dry Cups, Irritating Gums roasted Onions, and especially frequent Blisters &c. They act by increasing the action of the absorbents. — It is often desirable to discuss these purulent collections. This may be accomplished by a rigid adherence to the means for promoting absorption as Mercury, the antiphlogistic treatment is particularly required, also mercurial Plaster by such a method of cure we avoid Ulceration and the formation of Cicatrices. But when it is not discussed and arrives near the surface the question is whether it must be opened or left to nature. Its a general rule if it is situated in an unimportant part, very superficial much indurated and productive of no uneasiness, it should be left to Nature. For by opening it we will produce some inflamm. pain and irritation as well as pain. Callous edges are also liable to form especially if opened too soon or according to the common phrase before it is ripe. To this rule however there are so many exceptions, that the Surgeon is almost always in favor of opening. 1st the opening is required when it is situated under Fascia, sheaths of Tendons, dense hard cuticle, Periosteum &c. as the pressure caused by these membr: will cause the abscess to increase in size and much aggravate the symptoms. When under the Periosteum

an opening must speedily be made by which the matter can be evacuated or it will produce violent inflam: and death of the bone, but it has been disputed whether death of the bone is the cause or consequence of suppuration. 2d An early opening is required when an abscess is deep seated, as in making their way to the surface they will destroy the parts thro' which they pass: by progressive absorption and for the most part are tedious and painful. 3rd When situated in loose cell: and adipose tissue, as in the axilla around the rectum &c. they are apt to attain an enormous size, and when an opening is formed by nature, it is apt to become fistulous owing to the matter not being entirely removed. 4th When abscesses involve a large artery, it is necessary to make an early incision, for it may ulcerate the artery and the patient bleed to death. But in consequence of the arteries being so highly organised, there is little danger of its taking on the Ulcerative or Gangrenous stage. Boyer says that instead of the artery becoming thinner by exposure it becomes thicker by a deposition of coag: lymph. Sam. Cooper says that it is never involved unless the whole system is in a violent state of irritation or the Ulceration which he terms Phagadenic. But as the precise character and nature of the Ulceration cannot always be determined, it will be always prudent to open it.

5th An opening is required when it is situated directly over a circumscribed cavity as the Thorax, Abdomen, Joints &c

for fear they should open internally. But the danger here has also been much overrated 1st as it generally has a tendency to the surface, besides which 2d the serous mem. is much thickened. Sometimes however when the system is very irritable it is not sufficient.

6th To prevent deform. its particularly on the face & neck of females; they should be opened as soon as a blush appears and before inflam: affects the skin, by this means we prevent the formation of cicatrices. For if the skin is affected it soon becomes thin and assumes a bluish appearance. In such a state it will not unite to the under parts, in consequence of its losing a greater part of its vitality. We should also be careful to make a small incision, and evacuate the whole of the contents of the abscess. For this purpose Sir A. Cooper directs the use of a very narrow knife, & gives very particular instructions as to the direction of the incisions. When in the neck they should be oblique: in the eyelids transverse, but no matter in what part it is situated the incisions should correspond with the creases or folds of the skin, by which means the scar will be entirely hidden, we should also keep down the Inflt. of the incision by cold or Sulph. Zinc.

7th An early opening is required when the activity of the Inflt. has ceased, and the progressive absorption is tedious with little disposition to point. In such cases the skin becomes thin, the cellul: membr: is absorbed, and the parts

become livid, and as much disposed to ulcerate in consequence of their vitality being so much diminished. A timely opening here would save much skin, and prevent a union; but when left a troublesome and indolent Ulcer will follow. 8th Great Pain is often sufficient to demand an early opening as when it is situated in the Globe of the eye; The Tympanum: under Fascia: in the body of the Testicle: in Bone &c. 9th It should also be resorted to when it impedes the function of a part: as in the Corp: Cavernosa preventing a flow of Urine: in Trachea preventing respiration, or the Oesophagus preventing deglutition; or in arteries or tonsils; or in the Cranium ~~of~~ impeding the functions of the Brain.
10th They should be early evacuated when much sympathetic disturbance is induced as Nausea, vomiting, headache Fever Epilepsy &c. In some cases small abscesses will keep up the fever for a long time, and even cause death unless removed. When in consequence of any of the above exceptions the surgeon is determined to open the abscess it has been recommended to choose the most depending position. But this is not always proper, as it may point at some other part; in such cases we should always open where the skin appears thinnest instead of cutting thro' hard and indurated parts, as must be the case if we follow the above advice, and we should also much augment the inflam. If the pus should not find a ready outlet one

must change the position of the part, or by the judicious employment of pressure at each dressing we may be enabled to effect it. Sometimes it points a second time, in such cases we must make a second and even third opening if necessary. This is termed counter-opening. When an abscess is deeply seated or under a Fascia, it is not to be expected to point. When this occurs we must be guided by the fluctuations and should choose the most depending part from which to evacuate the Pus. To effect this some surgeons use the knife, & others the Caustic (Physick and Cooper prefer the veget: caustic). It should be applied to the part at which the skin is thinnest. When opened the orifice should not be allowed to close, but should be kept open by warm soft Poultices, and stimulating fomentations, or by a dossil of lint, a probe, or tent, or some other foreign substance, as the lips have a great tendency to unite. After the matter is evacuated, one should endeavour to promote adhesion of the sides of the cavity. To accomplish this a certain degree of pressure is necessary, but be careful that it is not too great or we will produce ulceration and sloughing. It should always be greatest at the circumference and never over the orifice, as it will prevent the discharge of the matter and cause the disease to return. When by contraction, adhesion, Granulation & Cicatrization the abscess becomes obliterated, nothing is left but a superficial ulcer at the orifice, which by proper treatment soon heals up. It may be facilitated

by adhes: straps, compresses and bandages. When from any cause there is not a free outlet for the pus it causes a Fistula. 1st This may be formed by too small an opening or from a profuse secretion of coag: lymph, producing callous edges. When this is the case it has been recommended to lay open the whole cavity with a sharp bistoury and prevent its union by the interposition of lint, until it heals by granulations from the bottom. But the objection to this is that a large mass of flesh is divided as well as blood vessels and nerves, hence it has been recommended to pass a seton thro' the whole tract of the canal. This is said to produce a sufficient degree of inft: to unite the parts. This should always be in superficial abscesses but never in deep seated, on acct of which objections a 2nd mode has been proposed which will generally be found to answer. It consists in dilating the external opening by Wax Bougies, Sponge Tents &c. They should often be removed say every 2 or 3 hours, that the pus may be evacuated. The size of the substances used must constantly be increased, and as the granulations form at the bottom of the cavity, they must be shortened. Dr. Physick has used this plan with success. Gum Elastic and Silver Cannulas have also been used for this purpose but they are not so good. 2d Fistula, is sometimes the result of debility, the part not being able to granulate. This is owing to the skin being so very thin that scarcely

any blood is sent to it hence the use of Stimulants, Caustics, which are preferable to the Knife. After an opening has been made a poultice should be applied to promote suppuration and granulation, and to facilitate the contraction of the Ulcer we should use properly regulated pressure especially in deep seated Fistulæ. Care must be taken that the Ulceration is not too great and that suppuration is arrested and not retarded. 3rd Fistula may arise from the presence of foreign bodies as musket balls, pieces of cloth, bone &c, and must always be removed by a surgical operation before they will heal. Such therefore are the local remedies for suppuration but we frequently have to resort to general means to support our patient, or he would sink from the profuse suppuration. Here a simple and nourishing diet with Tonics must be resorted to. At first it must consist of mild articles, but afterwards followed by the stronger as Serpentaria, Bark &c Laxatives must occasionally be resorted to, to prevent the accumulation of fæces in the bowels. Opium also to produce sleep will be found useful.

I shall now speak of the 5th and last stage or Gangrenous and Sphacelous. When our remedies fail to produce any of the preceding terminations, and the Inft. continuing with great violence the parts soon become exhausted by which Gangrene and Sphacelus is produced. It may also arise (as previously mentioned) by the inft. occurring the slightly in a weak part. To prevent this unfortunate issue

we must endeavour to moderate the action and regulate it in proportion to the degree of strength the part possesses. Hence when the general and local symptoms are violent the strength of the part and system being good we must resort boldly to the lancet, as well as to the Antiphlogistic means generally: so as to diminish action at once, and repeat it as long as Inft. is present. We must also resort to the use of local evacuations by Leeches, combined with Cold. In resorting to such remedies we must be cautious not to carry them too far, and at the same time watch vigilantly for the first symptoms of prostration, which generally appear suddenly, and as soon as they appear we should discontinue their use, & by careful discrimination they may be detected. It is sometimes first manifested by the appearance of Sordes about the teeth and tongue, or by a slight delirium, wild eye &c. If a violent Local Irritation be produced in an old constitution or one ~~[illegible]~~ debilitated by previous evacuation or Fever, we must give strength to the system by a nourishing diet, Tonics, and Stimulants, while at the same time we resort to cold applications, local bleeding &c from the part for the purpose of reducing Local Inflam: On the contrary when the general system is system is strong, and the affected part debilitated by Contusions, Cold, Poisons &c, we must endeavour by the application of Stimulants to give tone & strength

to the part to that it may be able to withstand the local irritation, while we pursue the antiphlogistic course with the general system; this form is generally produced by Poisons. When the patient is naturally weak or the part debilitated by cold, little can be done. In this way we endeavour to ~~[illegible]~~ prevent Gangrene, but sometimes all our remedies fail, and Gangrene is produced, and if not soon arrested Sphacelus will ensue. When this is about to occur the symptoms of local and general resolutment disappear and great depression arises. In such cases we must increase the strength of the gen: system as well as the action of the part itself. 1st As regards the System Itself, it must be accomplished by Diet, Tonics and Stimulants. The diet should be such as to strengthen the system and must consist of articles easy of digestion, and at the same time containing a great deal of nourishment, as the animal & veget: jellies, beef and mutton teas, eggs, oysters &c. and occasionally solid food if required, all in small quantities, and often repeated so as not to oppress the stomach. The effect which it produces must be noticed, for if it produces Fever dry furred tongue &c it is doing harm, and must be changed & given in smaller quantities, or animal food at least laid by, our object being to allay and not produce irritation. If the powers of the stomach are weak digestion may be assisted by the addition of Condiments

which cause an increase of the gastric juice, as Pepper, Mace &c Occasionally much advantage will be derived from stimulating drinks as Wine - Porter &c which act also as Tonics. Tonics also have been recommended and much voted formerly, but in consequence of their improper administration have grown into disrepute, but when properly given they are very useful. We must be careful not to impair the stomach.

Peruv: Bark was formerly used and was supposed by some to be a specific (but there is no specific for Sangrene). While others condemn its use as being inert. Cinchona is useful when properly adapted to the state of the system. The best of its preparations are the Aromat. Infus. wine, Salt of Bark, Quinine, the last is the best: they will generally be found grateful to the stomach but must not be given so as to produce nausea. When all these fail and the system continues to sink we must resort to the diffusible stimuli. Dr White of Manchester Eng. recommends Musk and Vol: Alkali which are very useful. Opium will be found of great importance as it relieves the nervous symptoms, and enables the constitution to bear up against the sedative influence of the Mortification. Thompson recommends 1 gr every 6 or 8 hrs, but it will have a better effect to give it at shorter intervals as 1/4 gr every hour or 1/2 gr every 2 hrs. so as to keep the system completely under its influence. Should it produce Fever, delirium, Loss of appetite we must

employ it externally as before recommended. Wine, Brandy, Spts of Turpent: will be found very useful. Such are the remedies generally advantageous not by any specific influence, but by affording a support and enabling the patient to digest his food. The 2d Indication in the treatment of Gangrene was to increase the strength and tone of the part affected (As our preceptors have left us no rule by which we are to be guided, the local treatment is entirely empirical and the different articles recommended are used in every stage). The treatment here is divided into 2 stages 1st While Gangrene is progressing. 2d after it has been arrested by Art or Nature. This last must always be done by the adhes: inf: in the surrounding sound parts, forming what is called the line of separation should this not be brought on the Gangrene will continue to spread. 1st While progressing our object is to support the strength of the surrounding parts. To accomplish which we must resort to the direct stimulants of which there is not much choice. Those mostly recommended are the various Alcoholic Preparations, Spts. of Turpent: and its kindred articles, Tinct. Bark, Spts Camphor, red oxide of Mercury, Balsams, Essential Oils, Hot Vinegar, &c Burns says that Turpent: and Spts. Camphor are the best. Cooper recommends diluted Nitrous Acid in the proportion of 50 gtts to a pint of water, and a poultice made of Beer Grounds, also Port Wine. On the same principle Dr. Physick

recommends covering of the whole Gangrenous surface and a portion of the surrounding parts with a Blister. 2d When by these means we have arrested the Gangrene, the separation of the dead from the living parts begins to take place: which is known by the appearance of a red line. It is here the duty of the Surgeon to facilitate the separation by the common principles pointed out when speaking of suppuration. With this view he should apply warm soft poultices over the margin of the dead mass, as bread and milk or linseed are preferable, tho' we generally find an immense number mentioned in Surgical works as Turnips, Carrots, Cicuta, Yeast, Beer Grounds, Charcoal, all of which will be found useful in particular stages. Stimulating remedies are here very improper. It is important to keep up the suppurative and ulcerative inflam: in the sound part and correct the fector from the dead. To accomplish this 1st the poultices should be as hot as the patient can well bear them. Beer Grounds, Port Wine, and Yeast are here very good. It is here particularly that Sir A. Cooper recommends the Acetic Acid: Acid. Stimulating ointments are also useful as Basilicon mixed with Turpent: 2d to correct the Fector, Charcoal and Yeast poultices are much extolled. Physick also advises the use of Nit. Acid, in the proportion of 1 pt to 8 pts of water. To be applied only on the dead parts, and be careful not to let it touch the sound part or it will destroy it. The Pyroligneous Acid above

all will be found most useful, rags wet with it must be placed over the dead parts. It is said also to be a gentle stimulant when applied, slightly diluted to the living parts. Gangrenous abscesses frequently form in cellular tissue. while the skin is sound and is frequently accompanied by a peculiar crepitation on pressure, this is owing to air being diffused in the cells of that tissue. In such cases the surgeon must make free incisions in the skin for the purpose of evacuating the matter and sloughs: for if they are not soon the abscess will soon rapidly spread by the Gangrenous tissue. This form is a frequent attendant on Erysipelas, Contusions &c. after they have been freely opened, All that is necessary is to pursue the course laid down under the head of abscesses. When the sphacelus is superficial, only affecting the skin and continuing to spread the sloughs should be cut away, care being taken not to injure the sound parts. We should also correct the Factor. Sometimes the whole surface of a limb becomes involved, here we must determine whether the patients' constitution be sufficiently strong to bear the irritation which is the consequence of sloughing or whether we must amputate. As a general rule Amputation should never be resorted to when the system is in a prostrate condition, as the patient would probably sink under the operation and if not mortification is almost sure to attack the stump. Hence it must never be performed when it depends on any internal cause, nor must we amputate while mortification is progressing, unless

say Thompson and Cooper, the symptoms are very urgent, for until adhes. inflm. has bound the part, it is not safe, and even then it is not too soon, and we should always wait until we ascertain to a certainty whether the system can bear it or not. The state of the stomach also should be attended to. To this rule Boyer, Ashgrick, and others say there is no exception, while on the other hand Military Surgeons assert that in Traumatic Gangrene (or that species arising from Gun Shot Wounds), owing to its progressing so rapidly, amputation should be performed immediately, or as soon as the system reacts, and even while Gangrene is progressing, as it is the only means of saving the patient. For in such cases it will often prove fatal in 6 hours. The same thing occurs when it has been caused by a ligature applied to the main artery of a limb or a vein, or when the limb becomes Gangrenous from any other cause, as the patient will sink before it can possibly be arrested: even in those cases where Nature herself is fully competent to seperate the limb without the aid of art, it is preferable to amputate, as the process is tedious painful, & productive of a great deal of constitutional irritation and which is accompanied by much deformity in consequence of the Bone projecting.

When mortification is induced without previous inflam: the treatment should be governed by the cause. It is sometimes pro-

duced by pressure, from tight bandages, splints or long continuance in one position, as in persons who have been confined to bed for a long time. In such cases the bandages &c must be removed and the part elevated in such a way by pillows and pads, &c, as to relieve pressure on the part affected, and the circulation restored by friction. When from internal causes as from Ergot, diseased arteries, veins &c the Surgeon can do very little, but by attending to the state of the system it may sometimes be arrested. If it should extend beyond situation original it must be treated as progressing Gangrene, of any other part by stimulants. In cases where an eschar is produced by ergot: caustics for the purpose of establishing an issue, it may be necessary to cause the slough to be detached. This may easily be done by applying a poultice; but sometimes when it is small it may be of advantage to prevent the suppurative inflam. for this purpose we may resort to cold and astringents as Aqua Ammon: Æther; cold and other evaporating lotions to prevent it and allow the part to heal gradually as directed when treating of Scabbing. No particular difference of treatment is required between Humid and Dry Gangrene except that in Humid we should apply antiseptics which would be improper in Dry. Sometimes the Surgeon should not wait for suppuration. Great attention must be paid to the general health, as an asthenic state of the system is generally prevalent in all extensive and

spreading Gangrene. The strength must be supported. Pott recommends opium, and it is useful in relieving pain &c. in Traumatic Gangrene, we should deplete but with great caution.

Monday May 23.

Chronic Inflammation

It that stage in which the symptoms progress slowly and as its name imports is nothing more than acute inf. continued for a long time, with a moderation of the symptoms. It may take on the chronic form at first, and is produced by the same circumstances as the acute; or it may result from the acute form.

Acute Infl: may become chronic 1st from the cause continuing to act, as the constant application of a blister or by the presence of foreign bodies. 2d from the treatment of the acute form but partially successful & not entirely or from improper treatment. This may be considered as the most common cause of chronic Infl. 3rd It sometimes becomes Chronic from mere general debility. This is often seen in Infl: and abscesses occurring in patients debilitated by Typhus Fever, Hectic, Night sweats, from great loss of blood, broken constitution &c. which cannot be cured unless the tone of the system or general health is in some degree restored. Sometimes it is original.

The causes are either internal or external When an external cause acts moderately a slow degree of Inflam. will be produced. The same is the case when the arterial system

is exhausted a very slight degree of heat or cold will induce Inflam: which will be chronic. It also occurs when Inflam. attacks a part vitally weak, as Bones, Tendons, Ligaments for tho' they are mechanically strong they do not possess much vitality: as we frequently have Inflam. of the Cranium from slight blows on the head or caries of the tibia from causes equally slight. When Chronic Infl. is produced from internal causes they are termed spontaneous and sometimes occult or hidden. It frequently results from chronic derangement of the viscera and system generally. Often however the patient complains for some time without any perceptible cause or sign of disease, and without his being able to assign any reason and when they appear they are generally designated by the term Serofulous abscesses or inflam: and may occur in any part but more particularly in the scalp, side of neck pectoral muscle, axilla, psoas muscle, buttocks and thighs. The symptoms are similar to those of acute Inflam: but much milder. We shall know more from the history of the case. The swelling even when superficial is very slight, without heat or pain, and the redness except on the eye or skin is not very evident. When acute infl. is transferred into Chronic the swelling heat, pain &c are gradually diminished It also loses its arterial color and assumes more of a venous hue. but when it arises spontaneously it not

subsequently continues for a great length of time before it is perceived. Often the symptoms are so mild that abscess which contain quarts of matter and chancres have been formed before the patient was aware of it. Sometimes however it is preceded by a dull pain and uneasiness with an interruption of the function of the part: as stiffness of the joint inability of the muscles to contract &c. But when it occurs as an original disease the swelling may be considered as among the first symptoms observed, being large, circumscribed, hard and Immoveable. Terminations. Chronic Inflam. rarely or never terminates by Detlescence. but occasionally by Metastasis, which is productive often of serious consequences, as an ulcer becoming dry may cause apoplexy. In some cases resolution occurs and should always be attempted when practicable. Secretion of Serum and other fluids is a common occurrence, and is the principal cause of Dropsey and the free discharge of fluids from the lungs is often seen in Chronic Bronchitis and from the bowels in Chro: Diarrhœa. Effusions of coagulable lymph sometimes occur but never to any great extent and the cyst or capsule in which it is situated remains free from disease which is not the case in Acute as they are then thickened. Sometimes there are adhesions But in Chron: Inft: large flocculi of lymph are often effused into the cavity of the joints; abdomen &c

causing hardness and enlargement. This form however commonly terminates in suppuration. The pus here differs from that in acute Phlegmasia by being thinner, whiter and mixed with flocculi, & like the serous part of the blood, and is said to putrefy sooner. In some cases it has the cream or healthy colour, but is never destitute of flocculi. When it changes from the acute to the chronic form, if seated superficially the alteration in the pus can be perceived. When the inflam. is deeply seated or in the all. mem. abscesses are often formed before the patient is aware of it, and present a large soft immoveable swelling externally, and in consequence of their occurring without heat they have been termed by French Surgeons Cold Abscess or abscesses by congestion, and may generally be considered as very dangerous from their arising in weak patients and debilitated constitutions. From the slow character of this inflam., they are a long time in forming, sometimes 5 or 6 weeks, sometimes as many months. When formed a cyst is prepared for them by adhes: inflam. which is very delicate and is not supported by the surrounding parts as in the acute, but the all: and serous mem: are not all or very little implicated, and as the pus collects it is spread in every direction, with but little tendency to the surface but will be carried by its gravity to the most depending part which is generally at a considerable distance from the part where it is formed. As we frequently see Lumbar abscess make its appearance at the groin, and sometimes travel as

as low down as the foot. This is what Hunter calls an abscess in a part, but, not of a part. Enlarging thus in every direction they acquire an immense size, and several quarts of matter will sometimes accumulate before it is observed. When it does arrive at the surface it has no disposition to point, nor is there any discoloration of the skin but uniformly an oval surface is presented. After a while however in consequence of the skin becoming very much distended by the constant accumulation of pus, a slight blush of inflam. is perceived, some pain is felt, ulceration takes place and the matter is discharged. Hitherto the patients' health and strength have been very little affected, but as soon as it is evacuated, even if it is small considerable debility is produced, and if large severe inflam. covers the whole surface in a few hours. The Pus becomes acrid and exceedingly fetid, followed by violent constitutional symptoms, such as chills, rigors, fever and great prostration. The cause of this sudden change has excited much dispute, Boyer, Thomson and some others say that this ~~change~~ Inflam. is ~~produced~~ induced by the stimulating effects of atmospheric air which produces a change in the secretions and renders them putrid. Abernethy supposed that it was produced by the continuous Inflam. spreading from the orifice first caused by Ulceration: but the occurrence of Inflam in the cavity however produced is evident from the severe pain and heat felt in the part; hence the greater the extent of the cavity the greater the danger arising therefrom. Should

the patient survive this, the sides of the cavity will gradually contract and its whole extent in length will become a fistulous one: this may finally heal and the patient survive. The Fistula is sometimes kept up by dead bone: in such cases they generally prove fatal from the continuance of the discharge. Cold and Lumbar Abscesses are not necessarily fatal when left to Nature as the cyst which contains them is not only a secreting but an absorbing membrane, and if the general health should continue good the absorption may take place in much greater quantity than the secretion can be formed and in this way perfectly restore the parts to their former condition without any bad symptoms attending. The danger in a great measure depends on the constitutional symptoms which are in proportion to the violence of the Inflam. The most frequent consequence of chronic Inflam. which we are called upon to treat is

Hectic Fever.

This is a sympathetic disturbance of the general system arising from some local Inflam. in a debilitated constitution and it bears the same relation to Inflamt Fever that Chronic Inflam. does to Acute. In some cases it arises simply from the slight irritation produced by opening an abscess and is particularly apt to occur in a nervous temperament; from long watching, great anxiety of mind &c. Perhaps it is more frequently the result of acute Phlegmonous Inflam. than chronic in consequence of the

part becoming putrid. When this disease is about to make its appearance considerable changes takes place, the pulse becomes weak, small, frequent and quick: skin pale and contracted except during the pyrexia: the conjunctiva is white, tongue clean and red, appetite variable, bowels constipated at the commencement but afterwards open and loose copious discharges of urine, burning in the palms of the hands and soles of the feet, colliquative sweats which are also cold and clammy, chiefly occurring either during pyrexia or apyrexia. There are also two paroxysms in the 24 hours: emaciation and debility increase rapidly accompanied by diarrhoea and excitement. fever arising from the slightest exertion, or the smallest portion of food or drink. In consequence of the great exhaustion and prostration the powers of life seem nearly exhausted, and death appears approaching with rapid strides. Besides the signs enumerated we generally find in the last stages oedema of the extremities, colliquative diarrhoea, violent inflam: of the throat, mouth, and stomach, which is continuous. Aphthæ are also seen on the tongue and in the mouth The violence of the constitutional symptoms is in proportion to the degree of irritation and if removed the patient may recover if he is not too much exhausted. This fever then is entirely dependant on the cause not on the absorption of pus as was formerly supposed. This is proved from the following circumstances 1st It does not

occur when large quantities of matter have been absorbed in consequence of discussing abscesses which would produce hectic if opened. 2d. The severity of the symptoms are not proportioned to the size of the abscess as it does not occur from a large ulcer of the leg, while the smallest one in the lungs, Brain &c will readily produce it. It may also be regulated by increasing or diminishing irritation. 3d that it frequently exists where no pus is formed. It will also be produced in consequence of the cause of the Inflam. continuing, also from affections of the mind. homesickness &c. Its progress varies according to the organ in which it is situated. What I have said applies principally to the cellular ment: and Lymph: Glands but when it exists in vital parts we find the symptoms approaching nearer the acute stage. hence the abscesses are more circumscribed, the pus more laudable and the constitutional symptoms commencing earlier. When it makes its appearance in any of the secreting surfaces as mucous membr: &c its character is much modified. Hectic Fever differs only from Inflam: by its occurring in a debilitated constitution.

Treat: of Chronic. Inflam:

As chronic Inflam: does not materially differ from acute we have nearly the same indication to fulfil. viz to prohibit the inflam. to the strength of the part. which is to be done by the same means, and accomodated to the case as recommended in acute. Inflam. 1st If possible

remove the cause, whether, chemical, mechanical, internal or external. When internal we are called upon to relieve some of the affections of the viscera which require med: treatment. Here the stomach and bowels must be attended to, to see that all perform their proper functions. Dr Physick uses purging. We must also relieve general debility by nourishing diet, Tonics &c. Resolution in all practicable cases must be attempted and should metastasis occur we must bring back the affection to its original seat. In endeavouring to promote resolution we should resort to the means already mentioned, but here we cannot as in Acute. Inflam. resort to direct evacuation from the part. We must have immediate recourse to the direct application of stimuli as alum; Acet Lead; Sulph. Zinc: Corros: Sublimate: Mineral Acid; Vinous Tinct. Opium: Turpentine, Blisters &c. with stimulating ointments made with red Precipitate, nitrate of silver, Nit. Hydra. Bascilion with Turpentine &c. all of which act on the principle of imparting strength and altering the action of the vessels. In chronic Inflam. fluid applications should be used in preference to ointments, as the fat which enters into their composition has a tendency to relax the parts to which they are applied and cause debility of the vessels. 2d. In using the various Alcholic Preps: and other stimulants of a volatile nature we must prevent their evaporation, if their stimulating effect is wanted to accomplish

which we must cover the part with flannel or oiled silk. the perspiration is also conducted on the silk, which keeps the part moist and comfortable. It is only in superficial Inflam. as the Eye, throat skin &c, that we can resort to this mode of treatment, and when deep seated we must have recourse to revulsants as setons, issues, blisters, Tart. Emet. Ointment &c, of these blisters are to be preferred in a majority of cases are repeated. We must act slowly and be careful they do not produce constitutional irritation; for if we increase the general symptoms we will aggravate the local. The consequences of Chronic Inflam. always require attention. Where there has been an effusion of serum or coagulable lymph the remedies for promoting absorption should be resorted to. Mercury in small doses will be found very useful. Its debility and irritability are very apt to exist we must be cautious in its administration or we will excite fever. to prevent this combine it with opium and leave it off when it affects the mouth. A decoction of woods as Sarsaparilla &c, have been used in this stage and said to be of great advantage, particularly when the system is very irritable. By such means then we obviate the Ulcerative Inflam: and try to promote Ulceration by the means already mentioned; sometimes however suppuration does takes place then we must resort to astringent and stimulating washes assisted by counter irritants which invite the flow of the blood from the Infl. part

this may be easily accomplished when it is superficial but when deep seated, cold abscesses are formed, and when formed they should be opened for the following reasons. 1st Because the surrounding parts are too weak to carry on the absorption. 2d In consequence of the adhesions being so slight that the abscess spreads and enlarges to great size hence the necessity of producing adhes. Inft. 3rd From its not being opened early the skin becomes so thin by absorption and the little quantity of blood passing thro' it that it is unable to unite with the other parts. 4th It will also prevent in a great measure the violent symptoms which follow a spontaneous opening as it does not cause so much irritation. These remarks apply only to small abscesses, but when they are large and deep seated the 1st Indication is to disperse them by the means already mentioned. Much in such cases depends on the restoration of the general health: for frequently by establishing that the pus is speedily absorbed. To accomplish this much benefit will result from Sea Bathing and gentle exercise Dr. Physick recommends purging on alternate days with cream of Tartar and Jalap. Emetics of Sulph. Zinc are recommended by some authors. Gentle Tonics must also be used. The Local Remedies most approved of are the long application of large blisters, setons, stimulating poultices but not where the part is thin. Cooper recommends common salt and water. ℥ss to a pint.

Yeast Poultices abs. but they are not so good as blisters. Should these means fail and the secretion exceed the absorption an opening must be made by the Surgeon, for if left to open by Ulceration violent inflam: and sloughing of the parts are almost sure to follow. When we have determined to evacuate the matter a valular opening must be made by passing the knife obliquely into the cyst, so that the opening into the cyst may not correspond with that in the Skin. As soon as the opening is made the matter must be evacuated in a continued stream by well regulated pressure, so as to prevent the admission of atmospheric air. When as much as can be got out with safety is removed the parts must be brot into immediate contact so that they may unite by the first intention. By this compl. manner we are sometimes enabled to prevent the violent constitutional affections which follow. Mr. Abernethy was the first to open these abscesses and in doing so he cautions us not to open them when the Skin is inflam or thinned by absorption as the edges instead of uniting will transcend the adhes: inft: and cause suppuration. After opening a slight inft. ensues attended by a thickening of the parietes of the abscess by which it is made smaller, after a while the pus again accumulates but not in so great a quantity here we must resort to the same means as before first to promote absorption; if that fail, open it with the

same precautions as before. In making a second opening we will have to make a deeper incision than at first in consequence of the sides of the abscess being thicker: If ulceration should take place at the orifice as previously mentioned, it is not to violent as it would be at first as the opening is smaller. Fistula occasionally occurs: sometimes from a diseased bone, at others from weakness of the sides of the abscess, in its not being able to throw out granulations, and take on the adhesive infl: When it arises from weakness only and there is no infl: we must resort to stimulating and astringent injections as Tinct. Cantharides Port. Wine &c which give tone and strength to the part and at the same time allow the sides to contract. Sometimes the dead bone may be removed, or the symptoms mitigated in a measure by the removal of a part of it, but it is not often the case, and consequently they prove fatal.

Treat: of Hectic. The general symptoms arising from chronic inflam. are such as manifest exhaustion. They will require gentle tonic medicines, stimulating diet &c. Occasionally they cause hectic in such cases the 1st Indicat. is to remove the causes. 2d to lessen the general irritation 3d to give strength. 1st Whenever we can succeed in removing the cause the fever will cease unless the patient is very much exhausted, hence all local irritations must be sought for and removed. With this view we must dissect out tumours, remove diseased bone &c When they

cannot be removed the influence of their effects may some times be ~~removed~~ moderated by proper attention. It often happens however to be seated in deep parts as the lungs &c When this is the case we cannot remove the cause; but here we must attend to the general system: impart strength and thus lessen irritability: for as strength increases debility irritability decreases, and thus by decreasing irrit: we indirectly give strength. This is done by avoiding every cause, the state of the bowels must be attended to, as well as the stomach and the diet properly regulated. Nutritious food will always increase it, that which will generally be found the best consists of milk and the farinaceous articles the sub-acid fruits, Sea and Moss, Eggs, vegetable jellies &c. Animal food should not be allowed particularly in pulmonary hectic as nothing will aggravate it more. But in hectic from other causes (if there is no febrile excitement caused by its exhibition) a little may prove useful. The avoiding Effluvia, and the use of fresh air are necessary to restore the general health. Gentle exercise as riding in a carriage sailing &c is good. Great attention must be paid to the patients' mind lest it should prove an aggravating cause of the disease, hence the utility of a change of scene, visiting watering places &c. Emetics and Cathartics sometimes prove useful by removing any irritating substances from the stomach and bowels. The 2d indication in hectic is to prevent and lessen irritability, to accomplish which

we must resort to Narcotics as Cicuta, Opium. Prussic Acid Digitalis. Of these Opium is the best. They operate by calming ~~nervous~~ irritability and nervous excitement inducing sleep and checking profuse evacuations from the bowels. They should be given in full doses an hour or two before the paroxysm. To invigorate the patient besides diet, exercise and fresh air we must resort to the mild tonics. Stimuli here are always improper unless the patient has been in the habit of drinking, then a little good wine or brandy may prove useful. Cinchona is injurious and must never be administered as it is too stimulating and oppresses the stomach. Chalybeates are very proper as well as the acids, as Nitric, Sulphuric, and Muriatic, also Elixir of Vitriol as producing moderate evacuations from the skin. The Acids must be diluted and are then used with advantage, also the prussiate of iron. In the concluding stages we must endeavor to prevent the fatal termination as much as possible: with this view we must endeavour to stop the colliquative diarrhoea & sweats by whatever tends to promote strength. Elixir Vitriol Lime Water combined with bitter infusions: Chalk and Opium are used for this purpose. Silk Shirts are recommended for the purpose of preventing the evaporation of the perspiration. Opium must be given to prevent the paroxysm while bitter &c are given to allay. Diaphoretics are very improper.

Inflam: is modified by a variety of causes as structure function &c and different causes produce some diversity in its symptoms, as it is hardly possible for 2 agents to produce on the same time precisely the same effects or kind of inflam. But there is some peculiarity in the kind of pain or its appearance, this important fact is acknowledged by all scientific Physicians. Individual articles of each class also differ from each other not only in their degree of inflam, but in their kind as Rubefacients differ from blisters &c. The same is the case with Mustard, Alcohol, Turpentine, Dilute Nitric Acid: Tart Emetic, Corros: Sublimate, poisons, caustic &c each of which cause inflam, but each one is stamped by its own peculiarity. In some cases the difference is very slight, but still there is a difference: as a blister varies very much from the eruption caused by Tart: Emet: so also the different escharotics produce different slough. That no two agents produce the same effect should constantly be borne in mind that all stimuli should not be indiscriminately used but a selection made, as the inflam. caused by one may be cured by another, yet each will have their peculiarity modified by a variety of circumstances, chemical as well as mechanical. Among the first are heat & cold, the latter contusions & wounds

1st of Infl: Modified by heat or Caloric. In order that you may understand how infl: is modified by heat

I must first show you the effects upon the system. The matter that causes a sensation of heat is a stimulus and the effects depend not so much on the degree of heat as the rapidity of the application and the state of the system. When an individual is exposed to a moderate degree of heat the first effect is stimulating which is soon followed by a turgescence of the capillaries, which reddens the surface the cutaneous veins become larger, the sensations become more acute, the mind exhilarated the action of the heart and arteries increased, pulse fuller and more frequent & the secretions much augmented, in fact every part of the body is excited and the most delightful sensation produced. This is experienced when we first enter the tropics. If however the influence of the heat be continued any length of time he will complain of debility & lassitude, the pulse becomes weak tho' still full and soft, skin, mouth, & fauces dry & harsh the secretions are suspended and a slow fever generated. Heat then when first applied increases action, but when continued debilitates, this debility arises from the long continuance of profuse discharges, and also may be accounted for by the universal law that after inordinate excitement debility and prostration must ensue, hence heat is directly a stimulant, and indirectly a sedative. From these causes therefore, increased action and evacuation we account for the

debilitating and relaxing effects of heat. What is true of the whole system is equally so of a part. Examples of indirect debility in a part produced by the continuance of heat is strikingly exemplified in the hands of washer-women: being kept for a long time in warm water the skin becomes shriveled and white, the circulation is diminished, and the secretions suppressed. The same effect is seen on the application of a poultice, hence it should not be continued too long over a suppurating surface, for fear the surrounding parts should become too much debilitated: such therefore are the effects of a moderate degree of heat, but we also find that the body is capable of bearing an excessive degree of heat under certain circumstances. It has been shown by experiments that an individual can withstand the temperature of 250° F. In all these cases however the heat was gradually applied, a profuse perspiration takes place and the heat of the body is only increased 3 or 4 degrees. Hence the mere application of heat is not necessarily productive of Infl. provided there is a secretion of sweat and other fluids, and these should not be allowed to evaporate too hastily. From these circumstances we find that heat to a great temperature will not produce mischief if gradually applied but if suddenly it acts very differently by causing violent inflam: and even death of the part. It is of

2 kinds that which results from dry heat termed Burns; and that from hot fluids termed Scalds they will both be treated of under the head of Burns. The degree of Inft: will be proportioned to the degree of heat and for this purpose it has been divided into 3 stages. 1st simple Redness. 2d Effusion of Serum containing vesicles. 3rd The Texture is destroyed and an eschar formed. The three are often united as it is hardly possible for an eschar to take place without the other degrees of inft: in the surrounding parts: this is a very important fact and should be remembered in practice. The pain attending this form of Inflam: is very severe and pungent, with a great increase of irritability and sensibility so much so that simply exposing the part to the air aggravates the pain. There is also a great disposition to serous effusions, and: whenever the cuticle is detached we have suppuration without ulceration, but if the texture is destroyed an ulcer is formed which first secretes pus: after a while however it becomes indolent: the granulations are weak and pale cicatrizing slowly, and with a great disposition to contract. In the 3rd stage where an eschar is formed it continues to enlarge by the gangrenous Inft. this takes place in consequence of the sedative effect produced by the heat. The constitutional symptoms vary very much being severer in irritable habits, or in children, old chronic or intemperate patients, than in the middle aged. And in proportion to the extent of the burn, and not the degree

of heat, as a burn that is extensive tho' caused by a moderate degree of heat is much more dangerous than that of a much intense, tho' produced by a much greater heat: hence the danger arising from scalds, also when a delicate organ is affected. When small very few symptoms or constitutional disturbance are present: but when extensive, there is furred tongue, the pulse is sometimes not affected for several hours, then it is quick and vibratory and differs in its feel from all inflam. and is indicative of great irritability. When still greater the system yields at once to the violence of the shock: there is no pain but the patient complains of being cold and he is dull and stupid: chills and rigors come on followed by coma and sometimes convulsions. when still greater these signs are not produced but sudden prostration and immediate death is the consequence. Sometimes however the system reacts and violent febrile symptoms occur, from which he is still in danger: also from the violence of the shock the severity of the local inflam. The occurrence of gangrenous Infl. or profuse discharges of pus from the eschars: such are the peculiarities of Infl. produced by heat, and which have obtained the title of specific. The specific nature however must be regarded and the treatment conducted on the principles of Infl.d Fever.

Treatment. Burns may be considered as a specific Infl. if we consider a deviation from the common phenomena as such:

As in these cases it is modified by the cause the treatment also in some degree varies from the other inflam. The treat. of Burns is divided under two general heads constitutional and local. If the constitutional symptoms are not violent we must endeavour to manage it by mild drinks &c. But when symptomatic fever is induced, it is of an inflammatory type with nervous irritation, hence we resort to a low diet evacuants. V.S particularly, this is also demanded by the severity of the pain: the condition of the pulse is generally small - the use of cold ablutions are here very useful but particularly the Alcoholic, but as the irritability and sensibility are greatly increased we must resort to Opium, and the other Narcotics - Opium should always be resorted to when the system is irritable. In all cases of extensive burns where the system is overcome with chills, shivering coma &c the system must be raised by stimuli applied both externally and internally, all evacuations and exposure to cold air must be avoided: this is accomplished by wrapping the body in warm blankets. Wine at the same time must be freely administered: but by far the best stimulant is Opium in doses of 60 or 80 drops instanter and repeated every 1/2 hour until reaction takes place. We are not to be deterred from its ~~some~~ use by the comatose state which is present. Dr Bell says that it is the best remedies in such cases. It was formerly supposed that coma was always dependent on an engorgement of the brain

of the brain: but we have great reason to suppose that it is sometimes dependant on nervous affections alone and particularly in this case. Travers however declares that Opium is always injurious in coma. Should the system want the stimuli must be omitted, and sometimes it is necessary to resort to evacuants, that not often the case. The wine and Opium might be continued in moderate doses. In some extensive cases of the 3rd variety of burns an inflamy Fever arises about the 20th day. It is called secondary, here the system cannot bear depletion as it is of a hectic type; but we are called upon to diminish irritability and support the system according to the principles already established. During the profuse discharges caused by sloughing the system must be supported as in other Suppy.

Local Treatment. This plan is generally empirical as there are no positive rules by which we are to be governed. I shall treat of it under 4 different heads. 1st of the Treatment for simple Redness. 2d When it is accompanied by vesicles. 3rd When there is an eschar. 4th When there is Ulceration and Cicatrization. The 1st must be treated by evacuants, and remedies calculated to moderate vascular and nervous action: to produce detitescence and prevent the formation of vesicles. This is best accomplished by repellant and sedative articles: Cold is very good for this purpose: Cloths wet with ice water, cold vinegar and water, Aqua. Ammon: Aether Sc. or pounded ice or

mow with lard, all of which are rendered more powerful by the addition of astringents as Sacch: Saturni. It very much diminishes the irritation, and in some cases relieves the symptoms entirely which is called Delitescence. To obtain the good effects of cold it must be unremittingly employed, for if suspended for a time, reaction takes place and the symptoms are aggravated. We must never resort it however when the patient complains of cold or when the system is prostrated, as it is only applicable when the inflam. is violent. Great benefit is derived from scraped potatoes, clothes wet with vinegar alcohol, Ether spts of Turpent: &c. also by excluding the air from the part. On this principle we can explain the good effects resulting from linseed oil, olive oil, hogs lard, and especially the Carron oil which consists of lime water and oil. Also the other oily and adhesive substances: Larrey recommends Citrine Ointment. Cotton probably acts in the same way by excluding the atmospheric air: In the 2d stage the treatment consists of the use of alcohol, spts of Turpentine, brandy and the resinous substances generally. (Kentish was the first who introduced this practice) all these act on the principle that no two stimuli can act on the same tissue at the same time, as a blister applied to a part affected with Erysipelas will cure it: Turpentine is applied to a burn with the same view: They alter the action

of the part and substitute a new one. Turpentine is only useful for the 1st 24 hours or until it overcomes the peculiar inflam: of the burn: if continued longer it will increase it. In mild cases it does no good but will increase the pain and if applied to the sound parts it will inflame, hence it should be applied only to the injured surfaces. The other stimulants recommended act in the same way. When Burns are produced by the explosion of Gunpowder, the small grains must be picked out with a needle otherwise a cyst will be formed around them by the adhes: inflam: and cause deformity by leaving dark spots. In the 2d stage where vesicles have been formed or where the cutis has been detached, the inflam, being induced by the same cause, and being of the same kind only more violent than in the first degree we must resort to the same remedies, and the only question here is the management of the blisters. All at the present day agree that they should not be opened unless painful from the quantity of water they contain, and when they are opened let it be done by a small puncture of a needle at the same time be very careful not to raise the cuticle as sloughing will be apt to take place. But when the cuticle is detached and there is a discharge of pus which is generally very profuse, the same treatment must be resorted to as recommended under that head, as mild ointments, the canon oil, simple cerate &c. If the discharge is very profuse we must resort to the astringent and

ointment. Here Goulard's ointment, Hunter's, Turner's Cerate, &c will be very useful. Sometimes however when the part is very irritable and occurring in irritable constitutions we must resort to the use of poultices, after this a new cuticle soon forms and the parts entirely heal. The 3rd variety is where eschars exist, this form is generally surrounded by one or both the other stages. In such cases it must be treated as if no eschars existed, until the pungent pain is subdued. If it is very small we need not apply any thing but let it heal as above mentioned, when speaking of scabbing, sometimes however they are very extensive, and profuse suppuration takes place. It then becomes necessary to resort to stimulants internally; assisted by Terebinthinates externally with a view of supporting the system and arresting the Gangrenous inflam. When by these means the Sanguinous Eff. is arrested, the stimulating applications are to be removed and mild poultices substituted; occasionally the sloughs penetrate very deep, even into the cavity of the joints causing many very distressing symptoms, as fever, subsultus tendinum &c. Here beside the constitutional remedies Dr Physick recommends the use of splints, applied so as to keep the parts completely at rest and by this means he has prevented in a great measure those constitutional affections, so often attendant on these cases. Granulations are to be treated as those

arising from any other species of Inflam. To prevent their fungous growth, escharotics, prepar. Chalk, Lapis Calaminaris, burnt Alum: Caustics &c assisted by bandages and adhesive straps for the purpose of making firm pressure. To prevent union between the sides of the fingers, urethra, nose or any of the natural passages, their surfaces must be kept separated by interposing dressings between them or the frequent introduction of some instrument. There is a very great disposition in granulations and cicatrices &c to contract and cause deformity, but may generally be prevented by bandages, proper proportional splints, position &c. If deformity has occurred Mr. Earle recommends the cicatrix to be cut out, this forms a new ulcer which must be treated by such means as will prevent the deformity. Others recommend us to dissect up to a certain point and then reapply it and endeavour to produce union by the 1st intention. The advantage resulting from this plan is that we do not create so extensive an ulcer. I think this plan preferable when a cicatrix completely surrounds a limb as it sometime, acts as a ligature and causes an interruption of the venous circulation, when this is the case the plan recommended by Dr Physick is to be resorted to which consists of a simple longitudinal or transverse incision after which we prevent union and contraction by the proper means.

The general effects of cold are direct or indirect. It demands for its investigation an extensive knowledge of the human body. The effects of a diminution of temperature are modified by a great variety of circumstances. They vary according to the strength irritability and habits of the patient to whom it is applied. It also varies according to the means or manner in which it is applied, whether by gaseous, solid or fluid substances, or good or bad conductors of caloric. or whether it is suddenly or gradually applied. The living body possesses the power of generating heat by which the blood and all other fluids are kept at a certain standard, and this temperature is very little affected by any cause. I have already said the body is capable of bearing a great degree of heat, it can also bear a great degree of cold. When however the surrounding atmosphere is at the same temperature as the body (98) the heat becomes very oppressive and unpleasant in consequence of the equilibrium which exists between the external heat and the internal organs by which they are prevented from giving out any of their caloric. 62° is the most agreable but if the thermometer sink below Zero or even so low as 8° the internal organs remain the same and present an uniform temperature throughout. This resistance may in a certain degree be termed passive as we do not see any symptoms by which the body is generating heat. When the body on the

contrary is exposed to a moderate degree of cold and then brought into a warm room an agreable reaction takes place the nervous system is excited the appetite is increased, also the secretions and there is a universal glow on the surface hence when the degree of cold is not too great or too long continued, in a healthy constitution, we will observe the same phenomena that result from the application of stimuli, and on this account it has been called a stimulant, and by others the Tonic effect of Cold: this effect however is only secondary as the first effect is directly sedative and this is of great importance in practice. When the body is exposed to a very severe degree of cold the first effect manifested is a retardation of the capillary circulation: especially in those parts far removed from the heart, the skin at first is of a dark red color, but very soon becomes pale contracted & rough producing what is called Cutis Anserina, this contraction extends to the cellular tissue, rings fall from the fingers, and the actual bulk of the body is diminished: the respiration becomes uneasy and is attended by sobbing the force of the heart and arteries are diminished the pulse is sometimes frequent at others slower than natural sensation is blunted tho' at first it is very acute, the mental powers also decline, attended by great muscular debility & loss of taste if very long continued, there is difficulty of speech, the sight also is lost with a tendency

to sleep which if indulged in will be followed by a comatose condition, or state of asphyxia manifesting little or no signs of life. From such a state we see no effects of a stimulant nature but on the contrary of a direct sedative producing asphyxia and finally death without being frozen. If there is simply suspended animation it is possible to recover the individual to effected but if actually frozen there is little hope, indeed we have never heard of a recovery. Richter says that if it is possible to recover a body when stiff provided no effusion has taken place in the brain and the heart still acts. Dr Hunter on the contrary declares that all vitality must cease before any animal can be frozen, this he proved by many experiments on animals. Thompson's experiments also prove this fact, and at the same time he declares that if cold be sufficient or even long enough continued to freeze a limb, that recovery is impossible, in this opinion he is sustained by others. Such then are the direct effects of severe cold when applied to the whole system, and from which effects the body cannot be recovered but by the effects of stimuli: in resorting to which we must be very careful, for if an individual who is laboring under the direct effects of cold is brought into a warm room, and the use of stimulating articles resorted to such as hot tea, or toddy, rotat. articles to the nostrils, with warm injections

he will be speedily recovered but the reaction will be so great that he will die from an unusual apoplexy as it were. Dr Hellie has published a paper on this subject in the Edinb: Medd. Chirg Review Vol 1st Pag. 312 in which he declares that there is no danger to be apprehended from stimuli in such cases. Many others are of his opinion but his observations are not correct. Richter, Collisen, Larrey & John Hunter's experiments confirm the fact that if too great reaction takes place death will be the consequence. His observations go to prove that if any of the hybernating animals which are in a torpid state be exposed to the rays of the sun equal to a temperature of 60° it will very soon manifest signs of life but it will die in a very short time from the effects of stimuli; while others that are kept in a cold of about 40° recovered. He also states the circumstance of some black birds which were forced from the severity of the weather to take refuge in an out house, some from an ill judged compassion were brot in and exposed to a considerable degree of heat, all of which died while the others did well. Death therefore takes place in 3 ways 1st from the direct influence of cold 2d by its overwhelming the system and producing Gangrene. 3rd from the indirect effects or by the violence of the reaction causing inflam: Fever which may eventuate in Hectic.

Treatment: When in a state of asphyxia the leading indications are to raise the system from the sedative influence induced by cold, and to induce a safe reaction

care being taken that it is not too violent, to accomplish which caloric must be gradually applied, the patient must first be brought in a cold room the temperature of which must be little above that to which he has been exposed. If any part be frozen / to do which requires a temperature of 25° F. / it must be rubbed with snow or ice, which is heat to the patient. But if the cold has not been intense and the strength of the body not much reduced, the ice & snow may be omitted and warm fluids substituted with constant friction with the hand or flannel to the part most affected and to the thorax assisted by ether and the hot salts to the nostrils for the purpose of exciting the respiratory apparatus, also stimulate the upper part of the throat with a feather and warm enemata slightly stimulating must be used. When signs of animation or reaction appear frictions should be made with cold or warm brandy and other warm applications as hot water put into bladders and applied to the epigastrium, continuing the stimuli to the nostrils, and as soon as he becomes able to swallow give him some warm drink in small quantities as tea, brandy toddy or mulled wine, with warm injections. After that he may be carried into a warm room but by no means near the ~~fire~~ fire. The warm drinks should be continued here, and it would be proper to place him in bed where the caloric from his own body will gradually accumulate and by a continuance of the frictions a perspiration will gra-

breath out when all danger as respects the first effect of cold is passed. as there always seems a disposition for reaction to take place after the use of cold great caution is necessary in regulating the degree of stimuli both internal & external. When however we resort to the use of cold it must be carefully used, for if too freely used violent reaction will be the consequence or perhaps Inflam.ⁿ Fever and if too long continued Death. When from improper management too great reaction has taken place the Surgeon may generally prevent its bad effects: provided no disorganization has taken place by removing him to a cold atmosphere and making use of cold applications in some cases. V.S. may even be proper or locally to as to persuade the viscera.

Effects of Cold on Particular Parts of the Body. Here the same distinction must be drawn between its direct and indirect effects ~~and~~ as in cold affecting the whole system and it should never be forgotten that its direct effects are sedative. When applied to a part the same symptoms occur as when applied to the general system. the skin loses its color and becomes contracted, the irritability is lessened and tho' the pain at first is very acute the sensibility gradually diminishes with a contraction or diminution of the parts in size (as proved by rings dropping from the fingers) the skin is now deadly pale. The pain here produced has been called the stimulus of sensation and this on acct of the pain and contraction that it is called a

stimulant. Why it is produced we cannot explain but it also occurs previous to mortification or when the part is about to die, also from long fasting. In this way perhaps a part of the body may be killed from the direct effects of cold. I say perhaps, because it is denied by Larrey, who asserts that a frozen part can always be recovered and that cold is never the direct cause of death, but this is not universally the case for if the part is actually dead it cannot be recovered. When however heat is rapidly applied to a part depressed or killed by cold, reaction takes place, which varies according to the degree of depression and violence of stimulus applied. If the reaction is a safe one the tissues remain sound & perform their natural functions: but if it is violent it will be followed by a high degree of inft. suppuration gangrene &c. and in some cases mortification occurs without any previous inflam: The inflam: or local affections resulting from exposure to cold have been termed Pernio and when death takes place chilblain or frost bite. Richter declares that cold alone never cause inflam: or chilblain. Larrey calls it a predisposing cause to chilblains. Thompson says that it is always owing to the stimulus of heat, hence cold never directly produces inflam: or mortification as it is always owing to the reaction. That this is true various other facts may be adduced from Hunter who froze the ears of rabbits and then broke them, when no hemorrhage took place.

after a while they were gradually restored, and then found very much thickened and inflamed showing that it was owing to the reaction and not to the cold. Larrey also confirms this fact and says that during the retreat of the French Army from Eylau, and while they were exposed to the excessive cold of Russia the men continued healthy, but as soon as they arrived in Prussia and got into comfortable warm huts, there immediately broke out violent inflam.d fevers terminating in mortification and those who kept themselves warmest suffered most. These kinds of inflam.d affections differ somewhat from the common inflam.d and resemble, says Thompson, very much that caused by burns and like them are divided into 3 stages. 1st When there is only simple redness. 2d When there is vesication & 3rd Gangrene & Sphacelus. The first is characterised by diffuse infl. and purple color swelling and pain, the latter of which is attended with an itching or tingling sensation, with heat and redness. When severe, vesications attend which soon break and are followed by suppuration and ulceration which is very hard to heal as they soon become phagedenic. The constitutional symptoms are similar to those arising from other causes, sometimes mortification occurs before other symptoms.

Treatment. We are to be governed by the same principle as when the whole system is affected. The leading indication is to restore a

moderate reaction. This is to be done by a gradual introduction of caloric. The part, especially when tepid, must first be immersed in ice water or snow, care being taken that the parts are not fractured. The degree of heat must be very gradually increased, assisted by friction with cold brandy, camphorated spirits, vinegar and perhaps turpentine &c. Never allow the patient to come near a fire and in severe cases not even into a warm room, but place him in bed and allow his natural heat to accumulate. If however violent reaction does take place, Richter says we may put a stop to it by immersing the part in a freezing mixture. But if Inflam. & Chilblains are the only consequence of reaction it may be greatly moderated or removed by the use of Cold as Ice Water, acet. of Lead &c. Gibson recommends covering the part with carded cotton. When it becomes chronic, good effects are to be derived from the use of stimuli such as diluted muriatic acid; a solution of Mur. of Ammon: Alchol: Oil Turpent: Tinct. Myrrh Goulard's Lotion Alum Lotion &c. A very celebrated remedy in such cases consists of equal parts of Oil Turpentine and Balsam Copaiva. Wardrop recommends 3 parts of hot Liniment & 1 of Cantharides. The camphorated liniment is also very useful. In the 2d degree where there is vesication we must allow the vesicle to remain unopened and endeavour to moderate the

symptoms by repellant or stimulating remedies: If the cuticle is removed and suppuration takes place we must resort to the mild applications so often recommended. If however the ulcers becomes phagedenic we must apply emollient poultices, also the internal and external use of Narcotics. Ulcers Gangrenous Larrey recommends the application of a blister. From these views therefore we may proceed to detail the means by which their occurrence may be prevented. 1st Avoid sudden transitions from a cold to a hot atmosphere. 2d In winter avoid hot rooms and when the patient goes out let him be properly clothed, & use frictions and exercise freely. 3d The most effectual means is to give tone and strength to the cutaneous surface, ~~and~~ as it generally depends on a weakness of this tissue. hence it is more apt to occur in parts remote from the centre of circulation as in the extremities. It is also more apt to attack children and delicate females, from the same cause: for the purpose of obviating this state it will sometimes be necessary to resorts to stimulating liniments and frictions. but above all cold bathing with or without salt. In using cold it is done with a view of invigorating and increasing the capillaries, by the degree of reaction that takes place after its use. In this way I have been very successful in treating cold feet. I order them to be immersed in cold water 3 or 4 times a day.

The external mechanical causes are divided by Mr. Hunter into 2 divisions or in other words he treats of it under 2 heads. 1st Is where there is no external communication or rupture of the cuticle and termed Contusions. The 2d comprehends those injuries where there is an external communication or rupture of the cuticle and termed Wounds. The 1st by Inflam. suppuration, or Mortification may be converted into the 2d. Of Contusions. When any foreign substance is propelled against living body, the effects of the injury will be proportionate to the momentum of the substance and the importance of the organ affected. As the effects of an injury done to the Brain, Eye, Thorax, Abdomen &c are more dangerous than a like injury done to the extremities. Its effects also depend on the situation of the part, as it is more severe over a bone slightly covered with skin as the tibia &c. than over muscles &c. but it chiefly depends on the force of the impelled cause. There are 3 degrees of contusion, I shall first speak of that species termed Simple. In this there is no injury of structure or solution of continuity, but a partial or total suspension of their functions. Whenever a slight blow is made upon the skin, the first effect is to weaken the circulation, the part is numbed, and the nerve &c may be paralyzed. In some cases the whole limb may be in a state of asphyxia. The same thing happens sometimes by inflicting a slight blow upon the stomach

brain, thorax, &c causing immediate death. Should it however be made on parts not vital they may be recovered. This is therefore the first degree and the same effects may also be seen in organs remote from the part stricken. as concussion or contusion of the brain or the liver often happens from a fall on the feet or buttocks, this is termed a counter-stroke and cannot exist for any length of time without producing fatal consequences. If the injury is slight moderate reaction moderate reaction will ensue without any bad effects: but if severe reaction is more powerful and in some cases so great that gangrenous abscesses take place. Hence the reason why they so often occur from slight causes as it is owing to the degree of reaction and not the degree of injury in this stage. It at the same time points out the importance of attending to slight injuries of the vital organs.

In the 2d degree of contusion there is a solution of the continuity of the parts beneath the cuticle with interruption of the functions. Severe blows will often divide deep seated parts as serous and blood vessels, muscle tendons, bone &c, without any division of the cuticle. Many of these accidents are of a serious nature and will be noticed hereafter. At present I shall only notice that arising from the rupture of a small blood vessel. Sometimes there is nothing but serum effused into the cellular membr: producing swelling & puffiness

as seen in sprains of joints &c. but generally the red capillaries also throw out their contents, causing the red color commonly called Bruises: by the Surgeon Ecchymosis. The effusion always increases the danger of the injury. The quantity is generally small and is soon absorbed producing very little inconvenience. But occasionally a greater quantity is thrown out causing an interruption of the circulation by pressing on the nerves and blood vessels of a part, & unless in some cases artificially removed gangrene or sphacelus is the consequence. When the effusion takes place under fascia or other important parts it is sometimes productive of great mischief as under the trachea urethra oesophagus &c. and it is important to recollect that it is not always deposited in the cellular tissue and is some times in the circumscribed cavities. In Ecchymosis the blood is either fluid or coagulated generally the latter, and as the blood travels along the cellular tissue, the skin becomes variously colored owing the different quantities of red globules contained in the serum. In a few instances however the blood remains fluid, and is collected into sacs or cysts forming blood tumors. They are generally found under the pericranium in new born children in consequence of pressure during delivery and sometimes in adults from blows &c. They generally give rise to the belief that there is a fracture or depression of the bone. Why it should in some cases remain fluid is

not Brown. Hunter supposed that it was owing to a loss of its vitality: The same is the same in the blood of those persons killed by lightning, blows on the stomach, and in those who perish from malignant fevers &c. When fluid or coagulated it never becomes a chemical irritant, while excluded from the atmosphere, as it soon coagulates hard and becomes absorbed. If however the quantity is very great it may cause pressure and in this way act as a mechanical irritant. Pelletier has shown that as long as the blood is excluded from the air no change will take place in it: it soon coagulates the serum is absorbed and the coagula is dry, and he farther says that when the quantity is large it requires years for its absorption in the whole of which time not a single bad symptom will be manifested but if opened they very soon putrify causing gangrenous inflam. & death: hence the danger arising is chiefly from pressure or opening a cavity containing it.

The 3d stage is where the force applied is so great as to destroy the life of the part while that surrounding it is in the 2d and 1st degrees. All the tissues vary according to their vital power, consequently some parts have a greater of resisting injurious causes than others as Cell. Mem. Ligaments Tendons Bones &c may be destroyed and nerves, blood vessels muscle & skin remain sound. It is also owing to the effect of the injury as we see that a force can be applied

capable of breaking a bone without injuring the other parts. The same is the case in wind contusions when the whole of the internal structure is destroyed while the external remains sound. The degree of injury does not depend simply on the degree of vital strength but upon the structure also, as well as the manner in which it is applied. As the skin itself may be destroyed while the cell: muscl: remains sound. But it is well to remember that deep seated parts are frequently destroyed producing abscesses and gangrene without the superficial being at all injured. This often occurs to military surgeons. After the reaction has been subdued the slough if superficial will be thrown off without farther extension but if deep-seated it will be increased in size as suppuration and ulceration must arise to detach the skin

Treatment. The first degree of contusion seldom requires any care from the surgeon as when it is mild simple frictions with the hand or dry flannel will be sufficient to remove it. If however it should be severe we must endeavour to restore reaction by stimulating ointments with the flesh brush, dry flannel, brandy, vol. alkali. When any of the internal organs are injured or debilitated, with slow respiration weak pulse &c. or the patient is in a state of asphyxia & requires more decided means.

We must here resort to the use of stimuli by the mouth, nostrils or rectum, at the same time be very cautious otherwise reaction may be so great as to increase the Inf. As reaction comes on they must be omitted, and if the depression is not very great we should never resort to irritants and stimulants, but your attention must be principally confined to the temperature of the surface and always take care to prevent too great reaction.

The 2d degree of Contusion is where in addition to the functional disturbances there is solution of continuity. Here a certain degree of Inflam. is necessary for the restoration of the injured parts, and care must be taken that it does not transcend the adhesive stage. The effusion of serous or sanguineous fluids in this stage termed Ecchymosis demands attention and may be treated of under 3 heads. 1st We must endeavour to arrest or moderate the effusion. 2d to facilitate the absorption 3d When this cannot be accomplished to remove it by an operation. In the 1st Indication where there is effusion of blood from the small capillaries we must endeavour to suppress it by the use of cold and astringent lotions, they act by diminishing vascular and nervous action. Ice water here will be found very useful, also the Acet: Lead: Mur: Ammonia Salt of vinegar. &c. These must be assisted by rest elevated position, pressure, & not unfrequently by V. S.

and purgatives. After all the symptoms of inflam. have subsided, the 2d indication must be attempted; that is promoting the absorption of the fluid if small in quantity. This may for the most part be fulfilled by dry and slightly stimulating frictions, by rest elevated position and pressure: this is particularly applicable to the extremities but when it occurs in any of the internal organs as the brain, cavity of Thorax, Abdomen &c we can do nothing more than resort to the antiphlogistic plan by which we enable the lymphatics to take up the fluid. 3rd Sometimes however absorption does not take place, and it becomes the source of much anxiety or by its increased effusion it causes pressure and inflam. impairing the functions. In such cases we should no longer trust to absorption, and immediately remove it especially if it be fluid or contained in a cyst or circumscribed cavity, at the same time bearing in mind the danger of opening bloody tumors. Two methods for opening the cavity containing the fluid have been proposed. Hunter and Physick recommend the opening to be very small & in an oblique direction as in chronic abscesses. The fluid should then be evacuated in a constant stream by pressure so as to prevent the admission of atmospheric air. If possible the whole of the contents should be evacuated and the sides brought into immediate contact so as to enable them to unite by the 1st intention. If we should

succeed in evacuating the whole of the contents of the sac, the sides will unite but several operations are generally required. The 2d plan as recommended by Cooper Pilcher & others consists in making a free incision and evacuating the whole of the fluid. When the whole of the internal surface will unite by the adhes. Inflam, if it is brought into contact; but sometimes suppuration and granulations occur. The 1st plan is generally preferable particularly when the blood is fluid and the risk of Sangreene and Inflam. is much less. The 2d may sometimes be resorted to when the tumour is small, or when the blood is coagulated and contained in a separate cavity; even when this is the case we not unfrequently have gangreenous Inflam, in consequence of the contusion preventing the parts from uniting. Either mode however is improper when the blood is situated in the Meshes of the Cell: Membr: as the whole of it cannot be removed. In such cases we should not interfere with it unless it presses on some important organ, and then we must prepare ourselves to encounter violent Inflam: & Gangreene, as it is almost certain to be produced. When however from this or any other cause severe Inflam: has arisen the treatment is the same as that already spoken of under that head &c, all that we have to do is to moderate the symptoms and prevent gangreenous abscesses if possible. If they have taken place, make free

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incision, and evacuate their contents. The 3° degree is to be treated as Traumatic Gangrene from any other cause. The 2d Division of Hunter is where there is a solution of continuity with an external communication and as mentioned are termed Wounds. A wound may be defined a solution of continuity, having an external opening, and induced suddenly by a mechanical cause. They are divided into simple and complicated. A simple wound is a solution of continuity produced by a clean cutting instrument in a healthy individual, and in an unimportant organ. On the contrary it is said to be complicated when made in an important organ, where an artery, nerve, or bone is divided, or by its being made by a poisoned instrument, and in a part that is diseased. The complication may also be owing to the general constitution being bad, from any actual or present disease, and according to the temperament of the patient, his idiosyncrasy &c. Wounds are divided according to the manner in which they are inflicted and the kind of instruments by which they are produced, hence they are designated by the terms - Incised. Punctured Lacerated. Contused. Poisoned & Gunshot.

Incised Wounds. When in a healthy individual or tissue, a division is made by a sharp clean instrument the fibres are simply divided and should no other effect be produced and the part retain its power it is called a simple incised wound.

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In such cases there is an effusion of blood pain and a separation of the lips of the wound. 1st It is hardly possible to puncture the skin even with a needle without wounding some of the capillaries and producing slight hemorrhage. If however larger trunks are divided the degree of hemorrhage will be much greater, in proportion to the size and importance of the vessel: but this subject will be more fully discussed under the head of hemorrhage, and at present we shall only consider it as produced by small and unimportant trunks. The 2d view which presents itself is that of pain. this seems to depend on the division of the minute ramifications of the nerves while the degree is dependant on the strength of the injury, condition of the part, the manner of inflicting it, and the state of mind at the time. The 3d is the separation of the lips of the wound. this in the first place depends on the form of the instrument and when it is wedgelike the separation is greater than if thin & flat. 2dly It is owing to the elasticity of the part which is different in different tissues. The Yellow ligaments of the back possess this property in a great degree, also the skin, while the cellular membr: is entirely without it. Third the tension of the part also has great influence on the separation as muscles in a relaxed state do not separate as far as when extended. Fourth, but the most certain and important cause is dependent on the power of the tissues to contract.

this is evident in a transverse division of the muscles. This contractile power is found in a greater or less degree in every tissue of the body, unless perhaps the osseous, from this cause they are rendered more conspicuous in a ~~dead~~ living than in a dead body, and in young robust animals than in the old & debilitated. Such therefore may be considered the reasons why incised wounds are rendered favorable. When a very small incision has been made and not interfered with an effusion of blood takes place and closes up the opening by forming a scab which excludes the atmospheric air: adhes. Tuft: then takes place and the part unites by the first intention. When however from any cause the coagulum or scab does not form and the surface is not artificially protected from the air, it will soon run on to suppuration followed by granulations and uniting by the 2d Intention. In those cases when the cuticle only has been raised the dermoid surface also suppurates followed by a generation of new cuticle, but granulations do not occur as they are not necessary. Here a question arises why suppuration is more apt to occur when a part is exposed than when it is covered. From very extensive examinations it seems the only difference is that in one case the air has free access in the other it has not, consequently it must depend on the air alone: but some physiologists say that this is not the fact as they have injected air

into different cavities without producing this effect. They also quote emphysema as a case directly opposed to this view. On the contrary we are disposed to believe from many circumstances that it is entirely owing to the irritating properties of the air, for if any part from which the cuticle is removed as in burns &c. be exposed to the air it immediately produces pain and a great deal of smarting: but if the part be protected this sensation is not felt. Beddoes also confirms this opinion by his experiments, he says that if a part is exposed to oxygen alone the effects are more severe, and that no pain is felt when exposed to the effects of either hydrogen or nitrogen. It also appears to produce it by rapidly removing the moisture, then hardening and drying the surface, which is always a cause of irritation. That in this way they are injurious may be proved by many circumstances of exposure both of the serous and mucous surfaces, they soon become irritated in consequence. a suppression of the secretions takes place. This is seen in prolapsus uteri, vaginæ, rectii &c. When they are exposed for any length of time violent inflam. with lethe place followed by opacity of the cornea. If however these parts are kept moist tho' constantly exposed this effect is not produced. From this it is evident that the air is a stimulant, & the reason why its injurious effects are not manifest when injected into the cavities or diffused thro' the cellul: membranes in

emphysema, is that the secretions of the part keep them moist, besides which the air is only in very small quantities and not renewed, it therefore to be injurious must be allowed to act freely on the surface. Dr. Brown supposes that it is also injurious by removing the natural heat of the part and says that a certain degree is necessary to the restoration and maintenance of the secretion of the injured part, but in consequence of the air having free access this is removed and the part becomes dry & hard. Often in deep seated wounds the air acts only on the lips, & yet the whole internal surface of the wound is in a state of high Inflm. This is owing to the Inflam. spreading from the external orifice by continuous sympathy or inflam. as in chronic abscesses. The dangers arising from simple incised wounds are very few; unless they are very extensive (then a shock is given to the whole system, as in extirpating large tumours) or badly treated, or the patient is very weak.

Treatment. The indications here are first to remove any foreign or extraneous matter. 2d to endeavour to produce union by the 1st Intention. by placing the lips in contact. 3d to retain them so by proper means. 4th to regulate the degree of Inflam.

1st When the wound is made by a clean instrument there is seldom any extraneous matter to be removed but occasionally it is covered with dirt or some irritating

dressings: it should be then washed until it is removed. Many of our modern surgeons consider blood as a foreign substance, but elder Hunter was of opinion that union could not take place without it. At present however this view of the subject is nearly disregarded, but some physiologists speak of union by inosculation &c. tho' they do not universally adopt the opinion they still believe it sometimes necessary. As a general rule blood is to be considered as a foreign substance, and must be removed by washing in every instance. Wounds made by glass are considered as incised wounds here great washing and attention is necessary to remove all the little pieces or spicula. but from the extreme difficulty of doing this most surgeons advise it to be treated as common suppurative Inf. am. In following the 2d Indication a question has arisen as to the propriety and probable success of bringing together the divided portions when they have been entirely separated from their connection with the other parts of the body as the fingers, ears, nose &c. but cases of success have accumulated to such a degree that it is no longer doubtful. Parts therefore that are ~~not~~ completely detached if not too large, too much mutilated or contused should immediately be reapplied, and even parts that are large may be sometimes recovered provided they are completely detached. The old surgeons were in the habit of cutting them away, that that their practice was wrong

is proved by too many well attested facts at present on record. These facts have given rise to what is termed the Taliacotian operation which consists in dissecting up a flap of skin either from the forehead or arm, and applying it to the nose which is previously scarified after union takes place it is to be completely detached and properly shaped, of late years it has been frequently resorted to in other parts of the body as the mouth, and particularly when a portion of the urethra has been removed.* The 3d indication is after having brought the parts into contact is to retain them in their proper position by Adhesive Plaister, Sutures Bandages & Splints. 1st of Position. this is to facilitate approximation and prevent a separation of the lips of the wound. As a general rule this is to be done by relaxing the muscles and skin if the division is either oblique or transverse. If on the contrary the wound is longitudinal the indication is to be followed by keeping them tense. 2dly after a proper position is obtained we must employ suitable dressings for the purpose of excluding the air and to bring the parts more into contact. This is to be done by facilitating the coagulation of the blood to form a scab. Cooper here recommends the dipping of lint into the blood and applying it over the orifice this coagulates and forms an artificial scab which excludes the air it also dries and contracts by which it approximates

the edges still closer. In this way we are able to convert a wound with an external opening into one without it. This plan of scabbing may occasionally be assisted by art as by the application of Court Plaster, Gold Beater's Skin &c Thirdly. this method of scabbing will not always answer particularly in large wounds and where there is a loss of substance: here we must resort to adhesive plasters & sutures, both dry and bloody. generally adhes. plas. as producing less irritation is preferable to sutures: In some cases however they are necessary as in pendulous portions. but if we can do without them, we must. The 4th method is by means of compresses and Bandages. In the treatment of Incised wounds, the application of bandages for the purpose of keeping the parts in contact is of the greatest importance, so much so that they have been recommended by Louis and other Surgeons as a substitute for adhes. Plasters and Sutures even in places where there has been a loss of substance. By them also we are enabled to support the whole limb, and arrest the spasmodic contraction of the divided muscles, thus preventing the parts from being thrown out of their situation; they also arrest the effusion of blood from the small vessels. 5th The application of splints is very useful to keep the ~~part~~ limb at rest and the parts in contact. The Profession is indebted to Dr Physick for first introducing them, as by them we subsultus Tendinum

and other tetanic symptoms are often prevented. After employing these means, the case must be left to Nature, and all the surgeon can do is to regulate the degree of Inflam and see that it is neither too weak nor too strong. If too weak coagulable lymph is not thrown out in sufficient quantities and consequently union will not take place: if too strong it will transcend the adhes. Inflam. and run on to suppuration. Generally it is too great and must be moderated on the common plan by cold and repellant remedies, rest elevated position, general and local bleeding, the removal of all pressure as tight bandages splints &c. but above all keep the parts cool. Mr Cooper makes a remark on this subject which is very important to the surgeon: "he says that the great fault of all practitioners in "performing amputations is that they enclose the part in "too many dressings by which they prevent the adhes. Inflam. "1st after placing the flaps, and securing it by adhes. strips "they cover it with lint, over which some ointment is "thinly spread, next a pledget of tow following one or "two other bandages which very much increase the tem-"perature of the part, by which the blood is determined "to it and suppuration induced". In this way then we endeavour to promote union by the 1st intention.

Generally if no unpleasant symptoms arise the dressings should not be interfered with before the 3rd, 4th or 5th day in summer; and a longer period in winter

at which time the edges will mostly be found united: sometime, the union is only partial and runs on to suppuration. It is here to be treated on the common principle.

Punctured Wounds are next in frequency to incised & consist in the injury being inflicted by sharp, narrow pointed instruments as pins, needles, dirks, bayonets &c. Their peculiarities are owing to several causes. 1st The direction of the wound; tho' they often appear trifling with a small, contracted red or livid orifice, they are of great importance and should always be attended to and watched with the greatest caution: as frequently they are attended with injury of the arteries, nerves, viscera and cls of the cavities: when they enter the cavities they are termed penetrating, but these are complicated I shall consider hereafter: ~~at~~ at present confining myself only to punctured wounds where no important part is injured. The 2d is the manner in which the fibres are divided They differ from incised wounds not only in the direction but in the manner in which they are inflicted: as the instrument by which it is done is generally of a wedge like of conical form, sharp only at the point. On this account the fibres of the part are very much contused and lacerated; hence we may say, the more conical the instrument and the more rapid its progress thro' the parts the greater the danger: These distinctions

are of great importance and should be remembered by the practitioner. Owing to the contusion and loss of power in the part union by the first intention seldom takes place; while suppuration and sanguine are of common occurrence. From the form of the wound, any fluid effused by the vessels does not necessarily find its way out. The inflammation attending is often very great so much so that gangrenous abscesses arise which continue to enlarge until artificially arrested. In some cases the pain &c is very much aggravated by being confined under fascia; it is also aggravated in some cases by the presence of extraneous matter as dirt, pieces of clothing &c. These circumstances alone are adequate to account for the violent constitutional symptoms that occur: thus after a wound from a bayonet, tho' it may not penetrate important parts the system immediately sinks and the patient is found pale, shivering & prostrate &c. After a while however reaction takes place, which is often so violent as to cause death. There is also another danger to be apprehended in nervous temperaments, or in those whose constitution is rendered irritable from warm weather, anxiety, previous diseases &c. viz convulsions, subsultus tendinum, Tetanus &c. all of which are very apt to occur particularly in warm weather or hot climates, and are often met with in military life. The degree of danger varies often from the manner in which the injury is inflicted, its degree, extent &c

also according to the part injured as tendons, fascia, ligaments &c but all of these are much overrated.

Treatment. The surgeon should at once from his anatomical knowledge, know the extent of the wound, its nature and size and endeavour to form some idea what parts are injured. In this he will be assisted by occasional symptoms; but he must never introduce a probe to ascertain this unnecessarily, or without good reason to suspect the presence of foreign bodies, or unless they are superficial; for if deep, it must never be attempted, and then it must be done with the greatest caution, as it is sometimes productive of fatal consequences by the probe penetrating arteries & other important parts. Also in removing the coagula of blood &c Incisions are generally preferable, in extracting foreign bodies to probes & forceps as they produce comparatively but little irritation: besides which the part generally heals by the 1st intention. To promote this union the parts should be brought into contact, as soon as the substance is extracted and kept so by the proper means. We should then endeavour to moderate the inflam: by general and local bleeding leeches, cold particularly purging, rest & elevated position when there is much pain without arterial excitement. Opium must be freely given. Some surgeons instead of using cold resort to warm applications, they may sometimes prove useful, but they are generally dangerous

as they cause a determination of blood to the part and increase the danger of gangrene and mortification. By such means we are generally enabled to produce a cure: but should local Inflam: take place under the fascia &c we must make an incision in it transversely as regards the direction of the fibres, in order to relieve the tension, of the parts which is very great and thus we prevent gangrene. When suppuration is about to occur and cannot be prevented we should assist it by the application of warm poultices and fomentations to the orifice. When Pus forms evacuate it by free incisions and if Gangrene occurs, treat it as recommended in other cases. The antiphlogistic treatment is not to be depended on in all cases, as it will depend upon the constitution, season of the year &c. To prevent Tetanus Convulsions &c we should direct the patient to avoid all fatigue, exposure to the night air: at the same time give him a generous and nourishing diet, assisted by the use of stimuli & Tonics as Wine, Opium Porter &c. The use of external stimuli is also useful; Dr Physick recommends the application of a Sinapism or blister to the injured part and afterwards to be dressed with Hunter's ointment or hot spirits of Turpentine. Strong Brine is used in the W. Indies and it is said with great advantage: but above all try Lunar Caustic as nothing is so effectual. Cooper recommends Nitric

acid. Should all these fail we must lay open the wound in its whole extent. Dr. Physick succeeded in arresting two cases of Tetanus in this way. In such cases we prevent tetanus, but after it has occurred, instead of being benefitted by local applications, it is always aggravated. The treatment here must be entirely medical, the best remedies are wine and opium. Larrey mentions a case in which amputation was successful, this is doubted by many to have been a true case of tetanus: as in following the practice the patients have invariably perished under the knife: The use of stimulants has been very much abused here. Why they should be so useful in preventing Tetanus, I cannot say, perhaps by Counter Irritation. Incisions should not be indiscriminately used in all cases: tho' they are very useful in preventing Tetanus taking up bleeding vessels, removing extraneous bodies: relieving tension, removing slough, curing fistulas &c.

Contused Wounds are those in which a solution of continuity is made by hard, blunt & obtuse bodies: the fibres instead of being divided as by cutting instruments are torn asunder. Laceration & Contusions are both present when the parts are injured to a certain degree, and they resemble each other very much, and require the same treatment. All the observations I made respecting contusion, are applicable here, as there is a suspension of the functions of the part, and sometimes

complicated with death, hence they have been divided and treated of under 2 heads: 1st When the surrounding parts are only bruised. 2d When the part is actually killed, this last includes Gunshot Wounds, which are merely contused wounds accompanied by death of the part. 1st Of ordinary contused wounds when no part is killed. This is unimportant when the contusion is slight: but if the functions of the part should be destroyed and the reaction be too great for the strength of the part, adhes: inflam: will not take place, and in fact we are not to expect it, tho' it sometimes does, but this is rare: granulations are thrown out and union by the 2d intention generally occurs. When they are very extensive and great they transcend the suppurative stage, and terminate in Gangrene which tho it may not be seen at the first dressing will be found at the 2d. If the contusion is moderate union by the 1st intention may occur at the bottom of the wound, which is generally less injured ~~wh~~ while the lips slough away, there is but slight hemorrhage in such cases at first, even when large arteries are divided. The dangers attending on these injuries are great, & arise 1st from the shock the nervous system has received, manifested by cold, a disposition to sleep, weak pulse coma &c. 2dly From the violence of the subsequent Inflm. causing violent fever and from the profuse suppuration and the liability to terminate in Gangrene. 3rd From

Tetanus which is very liable to occur in warm climates, hot weather and bad constitutions &c.

Treatment. of contused wounds is to governed by the principles so often laid down. We must remove all extraneous matter by freely washing, at the same time we should reapply the parts as nearly as possible in their former situation, so that a part at least may unite by the first intention. This applies particularly to lacerated Wounds, by this the suppurating surface will be diminished. After the parts have been applied they should be kept in their situation by one or two strips of adhes. Plaster care being taken that no force or pressure is used, otherwise we shall have severe Inflam: and its consequences. Care should also be taken not to bring the lips into direct contact, but always leave a small space between as they become very much swollen, and Gangrene would occur from the sides pressing against each other. For this reason, sutures are not to be used, as they will cause great pain, fever &c and give rise to erysipelas. After the parts are adjusted and the strips put on a mild light plaster, should be placed over them, for the purpose of keeping the parts moist. When however the contusion is very great an emollient poultice should be applied, to facilitate the suppuration, this should be continued until it takes place which will generally be in 24 or 36 hours. After this, light dressings should

be used, such as will promote granulations and union by the 2d Intention. Professors Attalmie & Boyer oppose the employment of poultices to contused wounds, and say that they should never be used, as they invite the blood to the part and increase the secretions which always end in suppuration. The former of these Gentlemen uses cold application, while the latter employs astringents. However poultices always moderate inflam: by increasing the secretions, and repellants by diminishing the quantity of blood in the part. Hence we see, both are necessary, and either plan must be employed in preference to the other in certain cases. As when it is slight and attended by an effusion of blood the repellants are the proper remedies. But where there is much contusion poultices should be employed at once. Sometimes however they may be combined, and while poultices are applied to the orifice or lips, repellants should be resorted to at the circumference. In all cases care must be taken not to employ cold during the depressed states of the system or when there is chilliness; but delay it until reaction takes place. Should the Inflam: continue severe and Gangrene be threatened: the whole part should be enveloped in a blister as has been formerly recommended.

Gunshot Wounds. The 2nd degree of Contused wounds is where a portion of the part is actually killed from the force of the projected body; This is generally caused by gun-powder: These were formerly considered as something peculiar or specific & consequently the treatment was complicated, but since Hunter's time it has been much simplified & Surgeons now deny any difference except in the instrument with which it is produced & the velocity with which it passes thro' the part injured. I shall confine myself at present to those produced by a common musket or pistol in soft parts. These wounds differ so much in appearance that hardly any two resemble each other. In ordinary Cases says Hennen we have an orifice corresponding in size to the bullet when it entered the edges of which are inverted & of a livid & discoloured appearance; if the ball has passed out, there is another orifice which is larger, less livid, more lacerated & with the lips protruding. Those injuries are attended with very little hoemorrhage or pain unless a large artery or nervous trunk is divided & indeed for some time after he only complains of a sensation of weight in the part a wound thus made may be compared to a hole or canal, the parietes of which are in different states; the internal larger against which the ball has directly passed is killed, the

Gun Shot Wounds

next is lacerated & contused while the third is in the first degree or simple state of contusion, with a suspension of its functions &c.

The constitutional symptoms are very dangerous arising from the violence of the shock prostrating the system; they have some times been so dangerous & peculiar that some surgeons have supposed them to be poisoned. We find the patient trembling, with a sensation of sinking within, he becomes deadly pale with face yellow; profuse perspiration breaks out with a failing pulse & in some cases there is incessant vomiting. In this state of collapse the patient some times dies. Generally, however, reaction takes place — Gun-shot wounds differ from punctured & others in their direction & depth as some times they pass entirely round the body & by having a slough formed throughout the whole extent of the wound; They also differ from each other in several particulars 1st. according to the kind of body projected; 2nd its velocity. — 3rd The nature & peculiarities of the part injured. — 1st The kind of body projected. Bodies of almost every variety of form are occasionally thrown from large guns, bullets are the most common but wounds may be produced by battets of wood, broken sheels, nails,

Gun Shot Wounds

& on board ships especially by splinters which fly from shattered boards; some times also they are complicated by pieces of money, clothes, keys & other substances contained in the pockets, being driven in. It is obvious that bodies of an irregular figure must occasion more injury than such as are externally smooth, of a rounded form & moderate size, hence the more they are complicated the greater the danger.—

2nd The velocity of the body is the chief cause as by a law of projectiles, the greater the velocity the greater the force with which it impinges on the surface, as a musket ball passing with great velocity will cause much greater injury than when nearly spent; For this reason the slough is much greater at is entrance than at its exist; So also when it strikes a bone, if its velocity is great it passes through without splintering it, but if it is diminished it is turned off by it & only a portion of it will be killed. The ragged & contused condition of the parts where the balls passes out is not so much owing to its velocity as to the circumstance of its passing from a dense into a rare medium; also when its velocity is great it passes directly thro' the limb but if it is nearly spent, it may glance from it at an angle if it strikes a bone & go out in directly a different

Gun Shot Wounds.

direction from that at which it entered giving rise to the appearance of its having passed through the body - Some times the resistance of ligaments, tendons, fascia skin &c are alone sufficient to turn the course of the ball if nearly spent. When the ball passes in this way under the skin, its course may be traced by a dusky or livid line & a tumor corresponding with the size of the ball may be seen; When a ball is moving slowly it may strikes the skin & pass off without injuring the integuments in the least but the parts under the skin may be completely disorganised & a solution of continuity take place with rupture of vessels &c. When such contusions are received over vital organs, death is the immediate consequence; This was formerly supposed to arise from the violent commotion of the air produced by the velocity of the ball, hence called Wind Contusions. —

The 3rd cause arises from the nature & peculiarities of the part injured; as parts of little importance may be alone injured or at the same time a large artery, nerve or some important viscus may be injured - - These therefore are the nature & peculiarities of Gun - Shot wounds -

Gun Shot Wounds

The sloughs generally enlarge by the gangrenous inflam & extend into the surrounding parts, They will also aggravated by the presence of the foreign bodies, prefume of facia &c which increase the inflammation & finally ulceration occurs for the purpose of evacuating the sloughs &c. —

On our Prognosis we should be exceedingly careful as some times large blood vessels are contused & there appears to be no injury but in a few days a slough ensues & secondary hoemorage takes place; at other times various parts of the viscera may be injured & the surgeon not be able to detect it till it sloughs this with various other circumstances as constitution of the patient, season of the year, temperaments liability to tetanus &c render the prognosis very difficult.

TREATMENT.

The first thing that present itself in the treatment of Gun shot wounds, which have occurred in an extremity is to determine whether the limb can be saved or not; but this depends upon so many circumstances, nature & extent of injury as constitution, season of the year, habits of the patients &c, that it is hardly possible for us to decide, but it is sufficient for us to say that when it is attended by a laceration of large nerves, blood vessels, & bones soft parts & when large joints are opened we must amputate particularly if the bone

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is shattered & in the neighbourhood of a joint, many other circumstances will even when the injury is not so great; induce us to operate; as a want of proper accomodation; attendance; rest &c. particularly in battles on board ships &c. also when a part of the limb is carried away it is necessary to amputate as by so doing we have a smooth clean surface in the place of a ragged & uneven one; This makes the limb much more valuable afterwards; When amputation has been decided on the proper time for performing it will be as soon as reaction has taken place & always before inflammation has occurred or any constitutional symptoms is manifested or before a disposition to gangrene has commenced in the limb; That this is necessary is proved by several circumstances; 1st The patient is more willing immediately after the accident for by confinement & suffering he becomes weak & nervous; 2nd a simple incised wound is substituted for a dreadful contused irregular & slaughy & lacerated one, which puts his life in great peril. 3rd The aggregate amount of suffering is far less than that arising from a long & tedious confinement from the inflamn & irritation caused by foreign bodies, spiculae of bone &c.; with the incisions

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for their removal which must be the case when efforts are made to save the limb; besides which the profuse discharge of matter will weaken & jeopardise the patient life & 4th. The patient will not only suffer less but his chance of recovery is much greater a few hours after the accident than when worn out by suffering. 5th. If he escape with life, the limb from being shattered & deformed instead of being of service will be a burden to him & not half so useful as an artificial one & after all he will sometimes have to submit to an operation. When the injury is of less importance or situated on the trunk the indication will be 1st to remove foreign bodies, 2nd To prevent inordinate inflamn, 3rd To regulate the degree of infl^n; & 4th facilate the discharge of pus.

1st The experience proves that the forcible extraction of foreign bodies produces much greater injury from the irritation produced by probes, forceps &c, than that caused by suffering the ball or other body to remain it being in contact only with dead parts & finally becomes encysted particularly bullets & will remain years, in endeavouring to extract their injury is often done to arteries & other impors

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parts; For these reasons the surgeon is much less anxious for the removal of foreign bodies in gunshot wounds than in others if however it is near the surface, an incision should be made & the parts then heal more readily; It will also be very necessary to remove them when it impedes the functions of any important part as the brain & Incisions may also be necessary for securing large blood vessels or to remove splinters of bone & to return any of the viscera when they protrude; but the practice recommended by Boyer & other of resorting to incisions in all arm shot wounds with a view of changing the nature of the wound is wrong as this cannot be done unless the dead parts are removed nor can they have any effect in relieving tension as they direct the wound to be filled with lint afterwards by which the inflamm^n is always aggravated & as a general rule incisions are only to be resorted to when some obvious & decided advantage is to be gained; But when this is to be decided upon (for the method of doing it I refer you to Dr Harris) We not forget the cautions necessary in proving long & deep wounds large & blunt probes are preferable;

Treat of Gunshot Wounds

Bougies & Cathethers have some times been used for this purpose. The dressings are to be selected according to the common plan of treatment suppuration must ensue - therefore warm poultices should be applied. First dressing on a field of battle of white cerate & adhesive straps must be used so as to secure them. applications should be made if possible to the whole tract of the wound & repellants used for it. Second. To prevent too great inflamn. We must here resort to the cold & astringent applications as Sacch: Saturn: Boyers recommends a solution of salt & after inflamn: has occurred we must endeavour to prevent its raning into gangrene; by the continuance of cold & astringent applications at the circumference; While at the same time we encourage the suppuration at the several orifices; some times also we are enabled to prevent these symptoms; by relieving the tension & at the same time evacuating the matter; cups & Leeches are some times useful & in some cases the inflamn: is so violent that it require the whole of our antiphlogistic plan; hence the danger arising from immersing the limbs in hot poultices &c.

The suppuration & sloughs take place about

Treat: of Gunshot Wounds.

the 10th day. When small these wounds may be easily cured; but, sometimes in consequence of the extent of the wound & the nature of its cavity the pus cannot have a regular outlet & in consequence a fistula will be formed; This must be treated by incisions &c. in the tract of the wounds as formerly mentioned. Sloughs of ligaments & spic: of bone often keep the wound open.

The General Treatment is to be conducted on the common plan; first we are to induce reaction by the use of stimuli; as wine &c, assisted by the use of stimuli; as wine &c assisted by the use of warm enemata &c as soon as it takes place the antiphlogistic course must be resorted to caution is however necessary in the use of the lancet, particularly in hot climates & in warm weather as we will render the patient liable to tetanus. We should also be careful not to reduce his strength too much as he has a long time to suffer. The use of emetics & purgatives are useful & particularly in soldiers, whose irregular habits injure the chylopoietic viscera prevents depletion.

Poisoned Wounds.

POISONED WOUNDS have been divided into 3 kinds; Animal; Vegetable & mineral; The vegetable are very numerous & compose many of our medical agents as Strichnine, Opium &c.; but at present it is confined to those which produce a direct effect upon the skin; The mineral are also very numerous but not so much so as the vegetable these are arsenic, corrosive sublimate &c. The animal poisons are produced by wasps, bees, snakes, & other animals & they are either healthy or morbid - Healthy poisons are the natural secretions of the animal while the morbid are the result of diseased secretions & never exist in a healthy state: Such as small pox, itch, vaccine, poison from the viper, rabid animals, wounds in dissection &c. - Poisons all operate in one or two ways, they either produce local irritation, or a general affection by a direct impression upon the general system, The sting of a bee or wasp will only cause a local affection & no further effect, but if he is strong by a number, a general fever is induced; If however Strichnine is introduced into the skin, no local effect is produced, but the general symptom will soon carry off the patient; hence the best division will be into local or general.

1st. Local affection is attended by

by very great pain & as it is probable that all of them produce different phenomena it unecessary to go into detail it is of much more importance to observe that it is in some cases circumscribed as that produced by a wasp, bee &c. & some times diffused & of an erysipelatous kind as that produced by poison vine; In some cases it is confined to the cellular tissue without affecting the skin such as that produced by snakes so also with the wounds received in dissecting dead bodies, here some times a single puncture from a needle will cause the most violent effects if the parts are bound down by fascia &c. and they are more dangerous whether it arises from any poisonous effect which is produced by the body or from the local irritation it is still undetermined; however in such cases the local inflamn is always very great & confined particularly to the absorbents.

TREATMENT. This is to be conducted on the common principle laid down in all local inflamn - at once endeavour to moderate it. Those inflamn - caused by the bites of venemous insects, bees, hornets, wasps &c. must be treated by the local application

Treatment of Local effects

of stimuli; as brandy, turpentine, corrosive sublimate, sugar of lead, hartshorn & olive oil mixed &c. When from a number of these insects it assumes a more serious character; V.S, purging & the antiphlogistic plan generally will be required; Those received in dissecting are to be treated as I shall hereafter mention; When typhoid symptoms arise we must resort to the free use of stimuli internally.

The General effects caused by poison are those which affect the system generally & are attended by much pain with or without fever; as strickenine introduced into the system will produce little or no inflamn. nor any local affection but will cause violent spasm & convulsion; also the hydro-cyanic acid which causes immediate death; so also the bites of some of the vipers before local affection can take place; death is produced, but there are some others such as small pox virus that will lie dormant for a long time & will finally produce constitutional symptoms, & a change in the system so as to prevent it attacking the same person twice; so also the poison of a rabid animal will lie dormant in the body for 30 or 40 days

General effects of Pois: Wounds.

& will then produce hydrophobia; to these may be added affections arising from wounds received in dissecting dead bodies which often causes the most violent symptoms & death particularly in England & Ireland, here a question presents itself which if possible should be determined whether the affection arises from sympathy? or is there an absorption of poison? many say that there is no poison absorbed as it cannot be found in the blood. also that it often arises from bodies that are not putrid but sound & that it seldom occurs except in those persons whose systems are irritable. — Hence the affection is referred to some peculiarities of individual constitution; thro' is also confirmed by the fact of several dissecting the same subject being injured while some will be dangerously affected & even die, the others will not manifest the slightest symptom; on the other hand it is urged that it does occur in persons whose constitutions are sound & that other injuries will not produce it — Local affections are also met with in other & distant parts from where the injury was received

Treat of General Effects of Poisoned Wounds

showing that there is a poisonous agent floating in the system; but the constitutional symptoms are most severe; as to the mode of operation of certain poisons as opium, Strychnine &c the same question has arisen, whether its effects are produced by sympathy or whether they are taken into the system? Without entering into a discussion of the question; I will merely say that some seem to operate by sympathy while others are absorbed; & hence it will always be the safest plan to consider their effects as arising from absorption & to treat them accordingly.

TREATMENT. – The practical indication here is to prevent the absorption of poison. for this purpose several methods have been resorted to; one of the oldest is the application of a ligature tightly drawn around the limb so as to prevent the venous & absorbent circulation; but this can only serve as a temporary measure till more permanent can be employed; ablution or washing out the part is very ancient, This is to be accomplished by allowing a stream of water to run upon the wound – by this a considerable portion of poisonous matter may be removed, but it cannot be expected that all will be washed away; another method is to

Treat: of Poisoned Wounds.

remove it by suction with the mouth, this may be practised with impunity provided there is no abrasion of the cuticle of the mouth if however this is the case the mouth & fauces will generally swell & become very much inflamed; very great confidence is placed in this method provided it can be employed immediately - A more efficient plan has has been recommended by Dr. Barry, viz the application of cups to the wound which prevents the absorption by which the poison is prevented from taking place; they will not only prevent it but will also arrest the constitutional symptoms even after they have taken place; He says that absorption cannot take place in vacuo, this he confirms by many experiments.

He applied Nux vomica to a wound & afterwards applied the cups which had the desired effect; He also made a long narrow wound into the bottom of which a portion of the same substance was applied a cup was then applied directly over the seat of the poison & had the effect of suspending its action. If even strichnine is applied & convulsions produced the application of a cup

will prevent its effects; Barry supposed that it was entirely owing to the vacuum preventing absorption but Dr. Pennock has lately shown that it arises from the irritation or pressure caused by the edges of the cup hence it was supposed that weights would answer – The first effect of the application of the cup is to remove a part of the blood with which a portion of the poison is extracted, they also injure the structure of the part by which the absorption is prevented from going on.

After the application of the cups no absorption take place nor any constitutional symptoms for several hours, so that other means more certain may be had recourse to viz: caustic & excision. The advantages supposed to be derived from the actual or potential cautery is that it may destroy the part & cause a slough with which the poison will come away, but this is not safe as it may extend further than the slough or may penetrate with it & produce dangerous effects, therefore incision is preferable to the use of caustics; for when they are used we must keep the wound suppurating for 30 or 40 days. Of all the caustics when they are used the actual cautery is the best. Boyer recommends the butter of Antimony to be

Treat: of Poisoned Wounds.

to be employed all over the wound & some times it is necessary to enlarge the wound for this purpose with a bistoury. After this a blister should be applied over the whole surface & kept discharging for a considerable length of time; Hence we at once see the necessity of excision; but some will not submit to it & only in such cases are we to resort to the use of caustic as the process is by far too tedious & painful.— Excisions must always be preferred in bites from rabid animals here Dr. Physick has laid down some very important rules by which the surgeon is to be governed; he first directs an assistant to remove the patient's clothes & to wash the part repeatedly with strong lie or soap & water every time with a fresh basin of water & towel; This is to be done by an assistant for if done by the surgeons he might get some of the saliva on his hands & in operating introduce it into the wound; The incision should extend at least 1/4 of an inch from the side of the bite into the sounds parts. If there should be several wounds they should all be treated in the same way & if the limb is much lacerated it must be amputated as we cannot trust the excisions in such cases for many of the wounds may escape observation; on this account when the

Treat: of Poisoned Wounds.

injury has been received on the head be careful to remove all the hair otherwise they cannot be seen; In some cases all of the means mentioned may be resorted to viz free ablution, cups, excision, & after this the cups may be reapplied as they will be useful in drawing blood from the wounds; then Boyer recommends caustic & lastly the wound must be dressed to exclude the air.

The Internal remedies employed for the bite of the viper are numerous & all of them stimuli as aq: ammonia: Spts of camphor &c The internal treatment has been less succesful; Arsenic is much used in the west indies & is the principle ingredient in the pill so highly extolled for the purpose; Fowler's solution has been much used in doses of ℥j at the same time friction must be employed on the part with the following liniment.

℞ Aq: ammon: ℥ss
Spt: Terebenth ℥j
Ol: Olivæ ℥j. — M.

The remedies in hydrophobia are almost all preventive; experience point out to us the excision of the cicatrix even weeks after the injury has occurred & it is said to be nearly always succesful. Dr. Physick met with two cases of individuals who were bitten by the same dog six weeks after the accident one of them died

Ulcers.

of hydrophobia; the other became alarmed & had the cicatrix extirpated after which no unpleasant symptom occurred; but this is only negative proof.

Ulcers. – These are the result of ulcerative inflammation & may be defined a solution of continuity with a purulent discharge. Suppurating surfaces are to be distinguished from them as in the application of blisters on the mucous membrane as they are also suppurating surfaces; to be an ulcer there must be a solution of continuity; They are dependant on many circumstances as local injuries of any kind; they are also dependant on the general system as in fevers, derangement of the viscera; specific diseases & bad constitution; in such cases the slightest injury will cause the ulcerative inflam^n to take place here however we confine ourselves to the consideration of those that occur in a healthy part & sound constitution; we have suppuration; granulation; contraction & cicatrization as a consequence the pus is here called laudable or healthy; these ulcers may be known by the granulations, being small conical, & florid, with a disposition to unite & contract, no pain & soreness in them, but

sensible to the slightest touch.

The TREATMENT. — of this form is very simple, We should exclude the part from the air & as soon as suppuration takes place lay aside poultices &c. & use milol plasters with lint in the centre, at the same time keep the surrounding parts clean. We should also aid the parts to contract by bandages, adhesive plaster, rest, proper position &c.

The General Treatment — is also very slight & must be varied according to circumstances, the antiphlogistic regimen is to be strictly observed & no stimuli given on any consideration, It must however be recollected that a certain degree of infl.n is necessary to a healthy process; but as I before mentioned it may be either too weak or too violent hence the necessity of the division of ulcers into those of too great & those of too little action. —

1st. Of those in which there is too much action or as they are commonly designated.

IRRITABLE ULCER.

Home says that such ulcers are to be characterized by the edges being sharp & undetermined the bottom filled with cavities & no appearance of granulation but only a dark white or red

Irritable ulcer.

spongy substance covered by a white film & attended with a bloody or thin Ichorous discharge which is generally so acrid as to excoriate the surrounding parts, the whole of which is very sensible & painful to the touch. Sometimes the edges are found serated, very much inflamed which inflam.n extends to the surrounding parts; this form is owing to ulcerative absorbtion. — But in others we find the absorbents excited to a still greater degree & the granulations are removed as fast as they formed besides which large cavities are produced; Such ulcers are termed Phagedenic. This form very rarely occurs without being attended by Sloughing or gangrenous inflam.n. hence it is termed by authors Sloughing ulcer. In this say Boyer the parts become first red, then brown or of a livid colour & finally black; In such cases large portions of the surrounding parts are lost. —

The causes are either local or general, among the first we may mention pressure erect position, exposure to local injuries &c., but the most common cause is general or internal & depend upon the state of the system which

Treat. of irritable ulcer.

are very various & every deviation from health will produce an alteration in its appearance. Of course when the alimentary canal is disordered or the patient is suffering from the pain or from any specific disease as scrofula, syphilis &c all of which have great influence on their character: these circumstances are alone sufficient to determine the necessity of attending to the general system; The reason why they are influenced by every change of health is that, like all new formed parts they are weak; They differ also according to their seat, whether near or remote from the source of the circulation as the most obstinate ulcers are seated upon the extremities. Where the vitality seems less & the circulation is not so active its return to the heart being opposed by gravity; Mr. Home says that on this account ulcers in tall persons are more difficult of cure than in short ones; their situation also causes a modification or rather a change in their appearance; as over the Tibia: The diseased bone keeping up the ulcer whether general, local or specific.

TREATMENT. From what has been said the general treatment is very manifest; here we have great irritability & sensibility which we must endeavour to moderate; great attention

Treat of irritable ulcer.

is to be paid to the general system to moderate the inflam.n according to the circumstances of the case by V. S. Mercury, Soda, &c. They are used to regulate the secretions & calm excitement assisted by the occasional use of anodynes.

The numerous Local remedies recommended have the effect of either directly or indirectly reducing irritability. — 1st are those which increase the secretions & thus indirectly reduce excitement such as heat combined with moisture; the steam of hot water will here be very useful which may be rendered stimulating by the addition of Alcohol. — Fomentations & poultices are also very useful. 2nd ly These may be assisted by the narcotic articles which possess not only a powerful influence on the denuded surface but also on the gen.l system as they allay all nervous irritation. At the same time we should be careful that the system does not becomes too much affected as fatal consequences, sometimes result from their external application, especially in children. The best of these articles are the numerous preparations of opium, the infusion or decoction or the Acetate or Sulphate of morphia are very useful also the Extract

of cicuta, stramonium & belladona, decoctions of Poppy heads; chamomile flowers, hops &c. besides which poultices of carrots, Turnips & beer grounds are much extolled; probably they act merely as pleasant warm applications. Home recommends powdered opium. 3rd It may also be moderated by cold & astringent applications; this plan has been but little resorted to & why? I know not as I am confident they will be found useful — Thompson recommends what are called cold poultices & say that they are far preferable to hot ones; they consist of nothing more than common bread made up with lead water or some such article; Some however condemn the use of lead in such cases & say that by it becoming absorbed it is apt to produce pasalysis; but this danger is much exaggerated. Allen confirms this statement by saying that cold & astringent lotions will often answer when the irritation is not very great better than any other remedy; he uses cold salt water; lead water &c. cold produced by the evaporation of spirits of wine is also useful. 4th The irritation may sometimes be diminished by the use of stimulating or escharotic articles as by their use we produce a nerval impression

Irritable Ulcer (Treat of).

Red precipitate is also very useful. (Wise Man) Home recommends a weak solution of the nitras argenti. as Solution of common salt is spoken highly of by Physick. Citrine ointment &c are also very useful. 5th. Another plan is to destroy the whole surface by the lunar caustic or muriate of mercury when they are small. This changes its character at once & a scab or eschar is left & the parts heal up under it, but it must be remembered that we cannot resort to this plan when the ulcer is large. If suppuration take place under the scab we must make a small puncture & let it out or it will enlarge. — Higginbottom recommends this practice particularly when the ulcer is situated about the ankle joint or head of children. These means are all to be assisted by the occasional use of leeches, rest, elevated position &c., at the same time avoid pressure of any kind — hence the necessity of using lotions instead of poultices — Unctuous applications are generally injurious as they are apt to become rancid. Home recommends the use of Cold Cream but this is liable to the same objection — When the inflam^n. is so great

as to cause the sloughing ulcer we must treat it as formerly mentioned when speaking of gangrenous inflamm^n by nitric acid beer grounds, Poultices, blisters &c. —

The 2nd division includes those in which the inflam^n is too weak & termed on this account

INDOLENT ULCER.

In watching the progress of such an ulcer we will see that the granulations are pale, large, bore & flat, instead of being conical; besides which they seem to hang by a pedicle; they grow rapidly & rise above the surface without any disposition to unite & cicatrize; the margin are soft, turnid & livid, & much elevated above the surface. There is but very little discharge generally but the parts are covered by a pellicle or crust of a whitish or dark grey colour so tenacious as to be inseparable from the ulcer without considerable force, this is termed by the surgeons Fungus or proud flesh; that there is a lost of action in this ulcer is shown by there being no disposition of serum in them; The causes of this form are any thing which produces debility Boyer refers them to 3 heads, viz: 1st the abuse of poultices & nutritious applications. 2nd general debility as in persons of lymphatic

Treat: of indolent. ulcer.

temperament they are more dangerous & hard to cure; 3rd. It may also arise from some mechanical impediment as a dead bone ligament, tendon &c which prevent the parts from healing & a thin sanies & some times a fetid discharge is kept up for some time.

TREATMENT.

In the management of this stage the common practice is at once to resort to the application of strong caustics to produce a slough & reduce it to the level of the skin; Hom says this is a bad practice as it does not alter their character in the least nor their vitality as they are just as liable to occur again. He recommends them to be reduced at first by the weaker applications as a weak solution of nitras argenti; red precipitate; burnt alum; solution of blue or white vitriol; powdered rhubarb; dry heat &c. But decidedly the best plan is pressure & take care that it is not too great for if so ulceration & gangrene will follow. Here all remedies of a relaxing nature must be suspended & stimulants & tonics are to be used; dry lint will be found very useful spirited by pressure; When an ulcer of this character continues for a long time particularly when situated on

Chronic Indolent ulcer and Treatment.

the extremities it becomes a chronic indolent ulcer.

CHRONIC INDOLENT ULCER.

In this state they may exist for a great length of time without giving the patient any pain; the surface is covered with a white film; the edges are thick & hard or rounded & smooth & if granulations are found at all they are very slight; the bottom usually forms almost a level and its general aspect all giving the idea that a portion of the skin had been removed by the knife; This kind of ulcer frequently assumes the inflammation character from very slight causes & it is in this state of things that the surgeon is usually consulted, for in their ordinary state they are not at all painful & very frequently after we have produced in it a healthy appearance, after great trouble, some irregularity in diet or some other very slight cause will occasion the whole of the new formed parts to slough rapidly out, In chronic ulcers then we must compel the patients to adhere strictly to our directions as the least deviation either in diet or from exposure will at once dissipate all the advantages that we have for months be gaining

Treatment of Chronic Indolent Ulcer. here

Treat: of Chronic indolent ulcer.

is a great want of power in the system; the indications in such cases laid down by Home are very important. He says that the granulations are slowly formed & very weak when formed; as they give way before the ulcer heals or this may be the case even after the parts have cicatrized he therefore advises at first to give them strength & recommends for this purpose the application of stimuli instead of the use of relaxing poultices, ointments, fomentations &c. as was formerly recommended; he states the number of these ulcers cured by this plan, is in the proportion of 4 to 1 by the other; Ointments, however, are said to be useful when combined with stimulants, an exception to this rule must be used, the stimulants recommended are numerous such as, solution of blue & white vitriol, nitrate of Sylver, corrosive sublimate, diluted nitric acid, tr. of Myrrh, gastric juice of animals, red precipitate, & citrine ointment, dry heat &c. but in the use of all these stimulating substances judgement is required for they must be regulated according to the strength of the part; hence the necessity of employing different applications

Treat of Chronic indolent ulcer.

at the same time to the same ulcer. As the granulations form at the margin we should be careful not to apply the stimuli there or we will destroy them; in their place then at this part we should use mild ointments; while the stimulants are applied to the centre; it is also necessary not to continue them too long as they loose their effect by the parts becoming accustomed to the same stimulus & on this account they should be changed there are however many ulcers that will not heal from the application of stimuli in such cases authors recommends us to apply caustic to the whole surface & at once to destroy its nature; this may perhaps answer when the ulcer is small thro' it is doubtful when it is large; But almost all other methods are now superseded by the use of pressure which is decidedly the most important plan we can pursue; it is to be accomplished, either by bandages or adhesive strips; they were formerly applied entirely around the limb but this interrupts the venous circulation too much; We should also be careful not to apply them over every portion of the ulcer, but have a small space at the bottom for the discharge of pus: How they are useful cannot precisely

be determined; but we can only say that moderate & continued pressure invigorates the parts & causes absorption to go on more readily. Hence in old ulcers the indurated edges are rapidly removed, the parts approximated; tone & strength given to the new formed granulations with a disposition to unite, & the cicatrix is made more firm.

By some surgeons it is thought that the ulcer heals up quite as well & is less liable to break out again, if the patient be allowed to walk about during the cure (but this I think doubtful): However, it must never be done if there is any inflm unless every part of the limb is secured by bandages, If the ulcer is purely indolent & the general health bad it may be of advantage, but not without; if inflm should supervene we must treat it by the common antiphlogistic means as formerly recommended; Here it is necessary to impress upon you a caution with respect to these old indolent ulcers after they have continued some times the system become accustomed to the discharge; so much as that it may be fatal to suppress it as it

may cause apoplexys, palsies, consumptions, affections of the heart &c. Hence it becomes necessary in healing such ulcers to employ other means at the same time. To counteract those effects an issue was formerly substituted, but some risk is also attendant on the suppression of this, on this account the modern practitioners have chosen the bowels in preference, they here produce discharges daily by the use of cathartics, at the same time allowing a very simple diet.

1st. Of the Serous Tissue.

This membrane is very extensive all the closed cavities of the body may be considered as lined by it, it differs very little from the common cellular membrane & in fact may be considered as nearly the same; of course inflamn may be produced in it by the same causes which produce it, others viz they are; Internal, External chemical & mechanical; In its natural state it is white, but when it becomes inflamed it is vascular & very florid, its sensibility is also much increased, as manifested by severe pain when the inflm is acute; when, however, it is chronic this will not be case; when it continues for any length of time it become

Infl.n modified by structure 1st Serous tissue.

thick pulpy, less transparent & loses its power of secretion which continues only for a short time, it is then liable to terminate as other inflam.n frequently by deliquescence or metastasis, it may also terminate by an increase of its own secretions, this however varies in appearance as in dropsy it assumes the colour of the serum of the blood, sometimes it is brown at others turbid & if the inflam.n is very severe it is reddish from the mixture of red globules & occasionally pure blood is effused, but the most important termination is the effusion of lymph when the inflam.n is mild only a thin layer is thrown out which is very delicate & soon converted into a fine cellular tissue, but when the inflam.n is more severe there is a greater quantity of it thrown out, which is of a yellowish ¼ of an inch in thickness in some cases & very much resembles the buffy coat of the blood, It may then be peeled off from the membrane, after it continues for a length of time, several red spots become evident in it which are a proof that the part is becoming organised & it remains between the two layers of the serous membrane as often seen in the pleura.

Serous tissue.

In very rapid inflam.s, the lymph is detached in larges pieces & found floating in the serum; such cases are very dangerous; Commonly the lymph is merely effused on the surface of the membrane; which appears perfectly natural when scraped off; but occasionally it is effused in the substance of the membrane; when it is thus effused the structure of the parts is very much altered & thickened as well as the parts underneath. Terminations by pus some times take place, but, this is rare; when, however it does take place it is generally of a brownish colour & mingled with serum & lymph; some times large quantities are formed even quarts without any ulceration (A doubt has arisen in my mind whether the serous membrane can secrete pus for I believe it to arise from the organized lymph which has been effused & not from the membrane are very dangerous, as they form large abscess which arrive at the surface by progressive inf.n & are finally discharged, Occasionally it will make its way into the substance of the lungs & be discharged by the bronchia the same is true with respect to other cavities lined by this membrane & this is the only way that these cavities are blistered. When the pus is discharged from the cavity the opposing surface

come into contact & unite by the effusion of a small portion of lymph; as yet there is no evidence that serous membranes ever granul. for they never unite unless they are brought into contact — ulceration is also said not to occur originally in serous membranes: however when much distended they will ulcerate, but then it is said always to commence in the surrounding tissues & finally to extend to it like other membranes small abscesses will occur under it & some times large ones are found. — In a few rare cases the inflam.n has terminated by gangrene, this is usually seen in spots, but some times it is very extensive; the cavities in such cases are filled with pus; Even after this has taken place in one part it will not extend far as some other parts in the immediate neighbourhood unite by adhesion & prevent it. Independent of these there is an other very important phenomena that is the liability to continuous inflam.n. as when it is produced in a part of the membrane lining the cavity of the abdomen by wounds &c. it is very apt to extent over the whole; this liability to continuous inflam.n seems peculiar to the serous membranes; thro' it is occasionally seen

in other parts: nature here seems to make an effort to put a stop to it by adhesions; When the inflam^n^ of action is moderate by the effusion of lymph the inflam^n^ becomes circumscribed by which the infl^n^ is suspended & the cavity divided into smaller ones; it is said that even foreign bodies are encysted in this membrane.

TREATMENT.

From these facts it is evident that the principal object will be to produce the adhesive inflam^n^ by the antiphlogistic plan & prevent if possible.

2nd Mucous Membrane.

This membrane is also very extensive lining all the cavities with exterior communications & if we except the terminations of the fallopian tubes which enter the cavity of the abdomen they are all continuous with the cutaneous surface but all of them possess peculiarities different from each other, they are all very vascular & liable to take on the secretory action; Differing therefore so much in their nature from serous membrane their diseases also differ; but they are not so liable to continuous inflam^n^ as serous membranes & their infl^n^ do not spread unless they arise from a general

Mucous Tissue.

febrile excitement; a common catarrh will some times spread to the lungs & bowels but this is owing to a general cause as cold &c when they are produced by wounds & other local injuries, they are generally circumscribed & do not extend unless the cause is very violent, even then the contiguous tissues are more apt to be affected.

In inflammation of this membrane there is an increased redness; while the heat & sensibility are very severe; its natural secretions are suspended; but it does not become dry as might be expected from the nature of its action the discharges will at first be watery which will be sufficient to remove mild infl.ns provided the cause is removed, if however the cause still continues to operates & the secretions goes on, it will be altered & pus will be formed instead of a watery fluid. In this the mucous membrane is different from all other tissues as pus is here effused before lymph; by this they may be always distinguished & the fact that suppuration may take place without ulceration, if however the inflam.n is very great there is no pus secreted but lymph is secreted in its place;

Mucous Tissue

thus lymph assumes the forms of membranes of a cylindrical shape & is seen in certain canals & parts more so than in others as in the trachea, bronchia & oesophagus & occasionally in the stomach & bowels these adventitious membranes very rarely or never become organised & no adhesion exists between them & other parts; They are either thrown of as an excretion or coughed up; sometimes the quantity is so great as to cause death; The opposing surfaces of mucous membranes do not unite by the adhesive inflam^n as supposed by many, but there is great reason to believe that in all such cases it is owing to wounds or ulceration removing the mucous surface by which opposing parts of the cellular tissue are brought into contact: which contract & unite & this is an important fact in practice; some writers suppose that granulations are formed in these membranes particularly in the conjunctiva of the eye, but I believe that they never form unless the mucous tissue is removed — The inflam^n of these membranes particularly in the conjunctiva of the eye, but I believe that they never form unless the mucous tissue is removed — the infl^n of these membranes also extends to contiguous tissue by which the parietes of these membranes are diminished in

Fibrous Tissue.

consequence of the effusion of lymph in the surrounding parts forming strictures as seen in the urethra oesophagus &c. this deposition always takes place under the mucous tissue & not in it as once supposed. — They are very liable to ulcerate particularly those in the mouth; sometimes they assume the appearance of those caused by syphilis or as if a portion of membrane had been removed; these ulcers are not generally very large but have a great disposition to penetrate internally; hence large blood vessels are often penetrated by them, Gangrene also occurs in this membrane & in most cases involves deeply the surrounding tissues & should the irritation remain the whole will slough away — However gangrene in this tissue is of rare occurrence. Inflam.ns of the mucous tissue are not as dangerous as those of other tissues. The Treatment consist in restoring the secretion & for this purpose we must resort to stimuli. —

3rd Of the Fibrous Tissue.

This is also a very extensive tissue forming fascias sheaths of tendons, arteries, veins, corpus cavernosum, penis, sclerotica,

Fibrous Tissue

tunica albuginea &c, all of which are very strong they like all other organs are highly organised but in a healthy condition they are insensible but when diseased they are very painful; In natural state the vessels of this tissue carry white blood & adhere with the surrounding parts on both sides by cellular tissue & in some cases so closely that it is almost impossible to separate them — Their morbid phenomena also vary; tho' mechanically strong they are vitality weak; as they will not bear a great increase of their vital action, they will however sustain a moderate degree & cause effusions of lymph &c; by this effusion they will adhere together & occasionally to the surrounding parts: by long continued irritation they are very much thickened, some times as much as 1/2 an inch, the thickening is always greatest at the point of irritation & gradually diminishes to the surrounding parts; hence the idea that they are subject to continuous infl^n is incorrect as this is wholly dependant on the serous & other tissues & not on the fibrous as many have supposed — It is however true that very severe local & constitutional effects arise from this infl^n; but Bell says, that this is owing to the parts being locked down by this membrane, that such symptoms are produced this I mentioned when speaking of

Fibrous tissue

puncture wounds, so also very violent symptoms are caused where pus is formed & confined under the membrane, here they do not arise from the fibrous tissue, but in consequence of this tissue binding it down by long continued pressure the membrane is finally removed & the abscess makes its way to the surface, but it is much more apt to travel round or to some distance first - So also in sloughing. -

Treatment. We must remember that as the vitality of the parts are weak, when the infl.n is great it is difficult to restore them, however in such cases transverse incisions must be made to relieve it, so also when suppuration & gangrene take place so as to discharge the sloughs & relieve the severe pain, it is often necessary to do this before the suppuration takes place as in paronychia, opthalmites &c by so doing we also suspend or relieve the severe constitutional symptoms & tension.

Belonging to the same system are the Tendons & Ligaments; they differ in some respects from each other, but as regards their vital properties they may be considered under the same head these facts are very important as the distinction between nerve

Fibrous tissue

& tendons are but slightly understood even at the present time Cooper & others says that punctures of tendons will cause subsultus tendinum &c. & all the dangerous symptoms which arise from wounds of the nerves. — They are mechanically strong, but vitally weak; no pain can be produced in them, so little irritation exists in them that continued excitement is required to effect it when however it does take place gangrene is very apt to occur even while the other tissues are gradually recovering & in contused wounds they always slough — When the inflam^n is very moderate they are capable of adhesions & become united with the surrounding parts; it is the skin & cellular membrane that cause the deposition of lymph in the greatest proportion, it also takes place from the tendon itself but not in so great proportion hence they are capable of regeneration; these processes however require a great length of time when divided union rarely takes place in 2 weeks but are not strong under 6 or 8 — possessing the these properties they are liable to many injuries as contusions, wounds &c. particularly the tendo Achillis & ligament of the patella; they are some times ruptured by the violent action

Fibrous Tissue.

of the muscles, in such cases no pain is felt & the patient hears a noise resembling the crack of a whip which appears to him exterior to his person, this is attended with an irritability to move the parts; These accidents occasion no external wound & on this account are not so dangerous as wounds of tendons, when a complete division takes place it may be known by a loss of power & a vacuity is felt between the extremities of the divided portion — But this does not always happen as in cuts &c — it is some times found hanging out of the wound, this is also the case in some contused wounds — It may be recognised by its silvery appearance — a partial division is more difficult to detect as there is no loss of motion, a vacuity &c — here we must depend upon our anatomical knowledge as to the depth of the wound, the direction of the instrument & the situation of the parts; as in the wound of the tendon of the biceps in bleeding in such cases in consequence of the continued motion of the arm the parts do not heal, but a slow chronic inflm takes place which will be found to resist all our means & perhaps involves the patients life

Fibrous Tissue

by its extending up the arm, this is often the case with ligaments about joints as in sprains &c where there has not been any care taken of it, by its spreading to all the surrounding parts. —

Treatment We may expect of course that all contused wounds of ligaments, tendons &c will be followed by sloughing. In the complete division of them we must endeavour to approximate the divided portions by suitable position at the same time being careful not to allow the interposition of skin or any thing else between them, nor suffer the bandages nor any part of the dressing to press upon them as they may be displaced; on this account they must be very carefully applied so as to prevent its being made on the divided ends; splints are also necessary; these means should be employed until union takes place; but sometimes after employing them sometimes no union take place between the ends & the extremities of the tendon adhere to the surrounding parts & all motion is lost; In cases of this kind Dr Homer recommends the introduction of a seton which causes the necessary degree of inflm & consequently a

Muscular Tissue.

union to the extremities by which union the motion of the parts are restored. When however it adheres to the surrounding parts this will be of little use alone, in such cases Pash has proposed to dissect them up & bring the ends into contact, so that the parts may adhere; This it is said has been successful – Partial or incomplete wounds of these tissues are to be treated with the same caution by splints, rollers &c. & will generally unite in 2 or 3 weeks – Usually in such cases no bad consequences will follow; Sometimes when chronic inf^n has taken place the application of a splint will at once arrest the violent symptoms as in sprains &c.; Splints should also be used in the treatment of contused wounds of tendons & ligaments – If the tendon protrude it should be restored to its natural position if there is hope of reunion but if not; cut it off & replace the end; but deformity will generally arise particularly if there are any granulations as they unite to the surrounding parts. —

4th Muscular Tissue.

In this tissue are very great, it possessing

Muscular Tissue —

great irritability, vascularity & sensibility & was once supposed to be the only irritable tissue in the body they resist injuries to a great extent & when diseased they bear a great deal without destruction; hence we see sloughing of the tendons & cell membrane while the muscles remain sound they are however apt to suppurate; It is necessary that a distinction should be made between the large or long muscular fibres & the capillary vessels carrying red blood as what is termed irritability in the two is totally different; as we often see in fractures contractions of muscles throwing parts out of their natural situation this however is not inflam^n but this last is seen when the vessels are affected & it is this that we are speaking of & not of their spasmodic action; as the latter often occurs without any kind of inflam^n. — When a muscle is inflamed there is a loss of function; deep seated pain usually dull & heavy though when burned down by fascia very acute. The pus when formed is good but of a dark & livid colour & is readily secreted; so are granulations, but the granulations never take on the muscular form but from a sort of tendinous or ligamentous matter; muscles are liable to contusions wounds &c as in other parts & in some cases the fibres are ruptured by their own contractions; This may be known by a partial loss of power

ecchymosis & a vacuity.

Treatment – Here complete rest & coaptation of the parts are required assisted by bandages, splints &c with strict antiphlogistic treatment. Sometimes it is necessary to make deep seated incisions for the purpose of relieving tension, evacuating the pus &c.

5th Nervous Tissue.

This system is divided into 2. the cerebral & ganglionic, they differ very much in structure & function, but it is almost exclusively to the cerebral nerves that our views are confined, They are composed of a bundle of fibres enclosed in a sheath or neurilema, each fibre is supposed to be composed of medullary matter & a separate sheath connected together by cellular substance, Their vessels are very numerous – Tho' there are separate nerves for sensations & motion, they are so mingled together that it makes but little difference to the surgeon, The nerves of the face are the most important as regards an exception to this statement. The nerves of secretion, nutrition &c are very small in paralytic patients. – The cerebral nerves are very strong & even when the surrounding parts slough away they still remain sound.

Nervous Tissue.

Affections of the nerves are rarely idiopathic, but they are often affected by surrounding parts, mechanical injuries &c. In every incised wound some of the small filaments of nerves are divided & the wound heal without unpleasant symptoms, but dangerous consequences are the result of wounds of the large trunks, & contusions of them are very severe & felt at the extremities. When more severe there is a loss of motion & function, This may also occur from pressure & when great paralysis is the consequence, as seen in patients from long sitting in one position: -- during parturition from pressure of the childs head; Ligatures applied to the nerves will cause the same symptoms - Mr. Hennen observes that occasionally the toes only are affected by pressure on the sciatic nerve - Wounds of nerves may always be known by the acute pain at the moment of the injury & the loss of sensation & motion afterwards - When they are completely divided the medulary portion is pressed out by the neurilema, the secretory & nutrition of the nerve are also diminished & in consequence the nerves becomes much diminished in size. If the irritation of a nerve is continued it will cause prostration; but a mere division of it is merely attended by severe

Nervous System.

pain & no constitutional affection. At present there is no doubt but that divided nerves are capable of reunion; when slightly separated there is a kind of ganglion formed; but when separated farther there is a ganglion or button formed process at each end with a ligamentous or fibrous matter between them — In case of a reunion of the divided ends, sensation & motion will return after a while; Boyer denies this & Cuvier says that motion will return but not sensation — But that both motion & sensation do return is proved by the circumstance of a limb nearly separated from the body by an incised wound acquiring motion & sensation on being united; transplanted teeth also become painful — Heyden divided both the pneumo-gastric nerves by separating them at different times allowing one to unite before he cut the other the animal did well, but when he cut both at once the animal perished instantly; the time required for the union of divided nerves is variously stated by different authors a Cooper says that 10 or 12 weeks will be required for the union of small branches while the large ones require 5 or 6 months. The largest nerves of the body may be contused or lacerated without any constitutional affection thro' very painful at the

time they may also be exposed for a length of time in abcesses &c. without any bad effects & finally granulate & heal – Mr. Hennen mentions a circumstance which is well worth attention; he says that the neurilema will sometimes become inflamed & thickened and cause secondary paralysis. – Sometimes inflamn. of a nerve are produced & kept up by the presence of foreign substances, ligaments &c.; in such cases they are very painful & the pain is not confined to part but extends itself thro' the whole course of the nerve; this will also in some instances be attended by secondary paralysis, all of these phenomena take place without any redness & very much resemble the disease called Tic douloureux; Some pathologists go so far as to state that foreign bodies or injuries of the kind are always the cause of it, tho' I believe that it can take place without it. Paralysis is also an accompaniement of this disease & is not simply confined to the part itself, but affects others.

Treatment of contused & wounded nerves is precisely similar to that of other parts; Bring as near as possible together & keep them so; after they have united the paralytic symptoms will very soon disappear; If not we may assist by the use of dry frictions with coarse flannel; Cooper recommends electricity & Hennen says that the evaporation of ether will be found very useful but when it is attended by neuralgic symptoms

Osseous Tissue.

the case must be looked into & if possible removed, if it is caused by a bullet lodged in the substance of the nerve we must excise the injured portion if the nerve is injured we must cut out the portion of it — or if it is enclosed in a ligature we must suspend weights to the ligatures or twist them tightly. Whenever we intend cutting out part of a nerve always make the upper division first as by this means we prevent a great deal of suffering. In partial divisions of the nerves it has been recommended to divide them completely This, however, has been but little practised; tho' it has occasionally been ~~resorted to in injuries~~ of the head of the arm; here they recommend the integuments to be divided down to the bone, shewing that the tension of the fascia was the principal cause of suffering. From these & many other circumstances it is believed that a complete division of them is never necessary but they should be treated precisely as recommended under the head of tendons. Hennen says that this division is never necessary.

6th Osseous Tissue.

Bones are abundantly supplied, with vessels, nerves & absorbents tho' like tendons they possess but little low degree of organization

Osseous Tissue

or no sensibility in a healthy state; but are very painful when diseased; tho' mechanically strong they are vitally weak & capable of taking on the gangrenous & ulcerative inflam^n like all other tissues; but owing to their vital weakness they pass slowly thro' their different stages. They are liable to solutions of continuity. As the nation respecting the union of bone are very various, it is but right that I should mention the process; we will suppose a case of a simple fracture for an illustration; without any communication with the air. — It is found that they are first surrounded by a coagulum of blood; which finally becomes absorbed and the extremities of the bone, the periosteum & the lining of the medullary canal take on vit plasm & secrete by apte which commences about the 4th day & continues until about the 10th or 12th filling up completely all the space between the extremities of the bone; this is the foundation of callus — vessels, nerves, & absorbents enter it & it finally becomes cartilaginous & it is then that the bony matter is formed which soon becomes hard. This callus is at first very vascular & can easily be coloured by an injection, indeed some difference in vascularity can be distinguished after 12

Osseous Tissue

years; it becomes covered by a new periosteum
is cellular internally & contains a medullary
matter; this kind of union also occurs if
the bones are separated or only in contact
by their sound surfaces; as when the ex-
tremities pass each other in fractures — here
the callus is formed at its sides. This deposition
takes place more readily in the hard than
in the soft bones. — Osseous union takes
place with difficulty in persons affected
with scrofula, Syphilis, Scurvy; intemperance
old age &c, some times bony union does
not takes place. If the new formed callus
is disturbed by motion, from the parts being
too far separated, from the interposition
of foreign substances as dead bone or from
extreme old age; In such cases, however,
an attempt at union is made & a kind of
ligamentous matter is formed, the ends of
the bones becoming pointed & smooth, allowing
the parts to glide freely on each other forming
a false joint; in such cases there is always
a deficiency of inflam^on; but at other times
there is too much inflammation causing
suppuration & no union takes place as
seen in compound fractures here the

Osseous Tissue

inflam.d or exposed portions of bone secrete pus granulate & finally unite by the second intention. The granulations are of a light red colour much firmer than in other parts, & have a glossy appearance; This process is very tedious & makes great demands upon the system – Infl.n of this tissue may arise from other causes than those mentioned. They are either external or internal mechanical or chemical; Pressure of any kind will cause slight chronic infl.n but if severe & continued the parts will finally ulcerate, but not suppurate as seen from the pressure of aneurismal tumours &c. In some cases what is ~~termed~~ an intestinal absorption takes place; here the parts become much smaller & thinner tho' the escape remains the same (it resembles marasmus) besides pressure it may be produced by several other causes, as syphilis, mercury, scrophula, cancer &c., all of which may be considered as internal causes & injuries as external. – It is also said that fever will affect the external lamina of the bone. When the infl.n is superficial the symptoms for the most part are not urgent, but if deep seated & in the cells structure of the bone it will be very painful, causing fever, delirium &c. at first the pain

Osseous Tissue

of a dull heavy charac: is not aggravated by pressure, but by its extending to the periosteum it becomes very much so; the pus may be laudable, but more often it is thin grayish & very fœtid — When inflam^n does occur it will very often destroy the bone & in some cases the whole cylinder this is termed necrosis & is often seen in the tibia & inferior maxillary — Sometimes it is caused by caustics & Gunshot wounds & may occur & may occur when the periosteum is removed — Whenever any portion of the osseous fabric is destroyed new bone is generated but when only a superficial portion is affected it acts as a foreign body exciting inflam^n in the surrounding parts in consequence of which a circumscribed redness is seen & in a few days afterwards a fissure become perceptible which continues to increase until the whole of it is separated from the living bone; The process of separation is assisted by the living bone pushing off the lamina by granulations formed under it. This is termed Exfoliation and is truely a vital process as there is no solution or melting down of the parts, from

Osseous Tissue

the vital weakness of bones exfoliation requires a great length of time during which there is constantly present an ulcer which from its containing at the bottom dead bone is called carious which will not heal until the bone is removed by absorption or art — As I have mentioned the whole cylinder of bone becomes affected the spongy extremities excepted; here it happens as in the former case & ulceration in the extremities is induced by the dead bone which caused them to separate; but long before the whole shaft of the bone is removed the important operation of the generation of new bone commences. When this is about to takes place the periosteum which acts as an arch between the two extremities becomes very much inflamed, thickened & gelatinous & finally generates a complete cylinder of bone which surrounds the diseased bone completely & on this account is termed involucrum while the diseased part is called Sequestrum from being shut up by the other. The New bone is usually complete before the ~~old~~ is entirely separated & this account for the fact that the limb is in some cases strong enough to be used during the whole cure; the newly formed bone always remains very large — In some rare instances

Osseous tissue

the dead bone is completely absorbed, tho' more generally after being reduced in size by absorption it cause an ulceration of the involucrum & is discharged. This process is very tedious & makes great demands upon the System for several years that the formation of new bone depends upon the periosteum as mentioned by Hennen is proved by its never being generated when this is removed; in some cases of Gunshot wounds this is farther confirmed; Here the bone is killed but the lacerated periosteum becomes inflamed & takes on the secretion of bone which is seen depending or hanging from the bone in masses; sometimes if he survive either form an involucrum or arch which unites with the inferior part & he will finally recover but this can only occur when the periosteum is but little injured & the constitution of the patient strong & if this is not the case amputation will be necessary. —

The Treatment is to be conducted on the principle heretofore inculcated; a great advantage in knowing natures method is to know when to interfere; In superficial necrosis little is required all that is necessary is to keep the

Osseous Tissue

parts clean & whenever the lamina become loose to remove it as soon as possible for by so doing we prevent it from again becoming united by the granulations; Exfoliation is said to be increased by exercise; Cooper recommends weak solutions of nitric or sulphuric acid for the purpose of exciting it as well as the gastric juice of animals They, however, all operate by stimulating the soft parts; When it is deep seated arising from contusions, fevers &c the antiphlogistic plan must be had recourse to & if we have reason to believe that an abcess is formed in it we must Trephine to prevent it spreading & allay the excess of pain; When the whole cylinder is involved the mildest treatment must be substituted & we must wait patiently until the involucrum is completely formed then resort to the trephine & remove the sequestrum when loose which will entirely prevent the usual consequences. Hennen says that this should not be too long delayed as the bone becomes much denser & a septum is apt to be formed which will render it necessary to trephine in two places. We should not use the trephine unless the sequestrum is loose, & we must carefully remove all small pieces — Contusions

Osseous tissue

& wounds of bones including fractures are to be treated as a wounds of soft parts. The most important indication in the treatment of fractures is to regulate the degree of inf^n by antiphlogistic remedies that it may not transcend the adhesive stage as it will some times causing abscesses & thus converting a simple into a compound fracture; some times it is too moderate & in consequence union is delayed beyond the usual time in such cases it has been recommended to apply splints to secure the limb firmly & permit the patient to walk about. The use of stimulating applications has also been recommended but decidedly the best plan is to attend to the general system.

Mr. of Liverpool has recommended Electricity. To induce a strong union we must excite a sufficient inf^n to cause the effusion of lymph, some times however these means fail & we are compelled to resort to others; a case of this kind came into the hands of Mr. White who cut down & sawed off the ends of the bones, placed them in contact & succeeded in accomplishing a complete cure; tho' accompanied by

some difformity, but it is a dangerous operation as by it we convert a simple into a compound fracture; Dr. Hewson also succeeded in a case in this city; On the whole Dr. Physick's practice is far preferable which is to pass a seton thro' the divided ends of the bone; by which sufficient inflamn. is produced for union but it requires a long time before the patient can walk - 3 or 4 months are generally necessary Mr. Brady succeeded in one instance by pressure. Dr. Hartshorn recommends caustic & succeed in one case. Dr. Barton also succeed in one case by cutting down & applying caustic to the ends of the bone; Dr. Birch succeeded in one case by means of electricity after an artificial joint was completely formed; but they all operate on the principle of increasing the infln.

Compound Fractures The danger arising from these is in the formation of abcesses which by continuing for any length of time may make great demand upon the system & finally terminate in hectic; Compound fractures may be converted into simple by causing union by the first intention; This should be attempted in almost every case even if possible in gun shot wounds - modern surgeons never apply poultices as they always cause

suppuration & if our design is to promote union by the first intention instead of them we must apply cold to the whole limb.

17th Cartilaginous TISSUE —

Cartilages are found in various parts of the body as at the extremities of all bones forming moveable joints; it some times unites bones as at the symphisis pubis & in other cases entirely supplies its place as in the septum of the nose, ala &c. They are divided into 2 kinds the articular & the

It is not certain that they are an organised tissue but from analogy we are inclined to believe that they are; articular cartilages, however, show but little vital phenomena while others are considered as possessing a sufficient share & are capable of uniting by the adhesive inf. forming bone at the place of union — Cartilages in young subjects are certainly organised or bone would not form in them tho' they are very weak. They are also liable to ulcerate & slough particularly the articular cartilages, septum narium &c. Some Physicians say that they are absorbed by the vessels of the surrounding parts but I am of the opinion that some of them at least

are removed by their own vessels, at present we do not know whether they ever do granulate or not this may & in fact often seems to be the case in the cartilaginous septum of the nose in the others however the union is always bony.

Treatment. Here we must keep down inflam^n by rest, low diet & other remedies so often recommended & in case of fracture as in those of the ribs keep it at rest for a long time or suppuration will be apt to take place; When ulceration has commenced very little can be done by the surgeon unless the parts are exposed; then we must cut it off; but if we keep down infl^n in other parts surrounding it there is little to be feared from this as it seldom occurs originally in the cartilage itself.

8th. Arterial Tissue

Arteries are composed of three coats, Cellular, Fibrous & Serous; each of which has is peculiarities; the serous has an unctuous feel, is very fine & is ruptured with great facility; The fibrous membrane differs from other fibrous membranes by possessing a yellow or dun colour & great elasticity & is very remarkable for the facility with which it is ruptured; the fibres are circular; The strength

Arterial Tissue

of the artery is dependant upon the exterior or cellular coat, which is very dense & strong and differs in this respect from the tissue in other parts of the body these tissues are supplied by the vasa vasorum & neighbouring vessels also by the ganglionic & cerebral system of nerves & in fact they are very highly organised consequently adhesions readily occur, while suppuration & ulceration do not, as they exist for great length of time in the very centre of abscesses without being affected.

Arterial Hoemorrhage. The division of an artery may be recognised by the issuing of a stream of blood which coagulates much sooner than the usual blood & by pressure between the orifice & heart causing a diminution of stoppage of the stream; If the artery is only partially divided there will be more hoemorrhage than if it was entirely cut through; longitudinal wounds are on this account much more dangerous than oblique or transverse, in consequence of its running across the fibres. The artery is deep seated the blood is sooner suppressed than if external in consequence of the surrounding parts entangling the blood & forming a

Arterial Lesion

a coagulum which finally close the whole in the artery. If however the artery is entirely cut thro' the ends are retracted within the sheath, while the surrounding parts contract upon it & in this way partially put a stop to it; the blood flowing still however becomes entangled in the sheath & forms what is termed the external coagulum & by its pressure finally puts a stop to the discharge; at the same time the blood within the artery becomes coagulable as high up as the first arus to moving branch & unites not the sides of the artery but to the base of the wound; this is termed the internal coagulum to distinguish from the external. The suppression of the flow of blood from the divided artery is also assisted by the loss of blood diminishing the force of the circulation & causing in some instances, syncope; but all these means are to be considered as temporary only & before a cure can take place of a more permanent nature must take place; This latter may be termed secondary & consists of inflm which commences in the divided end of the artery as a consequence of which lymph is thrown out which becoming organised a union of the parts take place; after this the external & internal coagulum

Arterial Tissue

becomes gradually absorbed – As I before mentioned the partial division of an artery is more daingerous than when entirely cut thro' as here it does not contract, consequently the only natural method for the suppression of the flow if the coagulum which forms & to assist its formation we should compress the part; here the sheath becomes distended which prevents the orifice made in the artery from corresponding with the one in the sheath; the distention of the sheath presses on the artery and stops the blood; according to the experiments of Jones if the cut in the artery be equal to 1/4 its diameter, nature will be incapable of suppressing the hæmorrhage; & it can only be done by pressure which generally causes an obliteration of the canal (Some Surgeons doubt whether a punctured artery can heal by other means than the obliteration of the canal) – Arteries are also subject to lacerated & contused wounds, but they do not bleed as freely as the former & in some cases not at all; This depend first upon the paralytic condition of the artery itself; 2nd from the laceration of the surrounding parts they become inflamed, thus cause a much

Arterial Tissue.

larger coagulum; 3rd – because the blood in contact with bruised parts coagulates more rapidly than in other parts; 4th From the laceration of the coats of the artery internally & entangling with the cellular membrane externally it forms a coagulum sooner; 5th – From a collapse of the sides of the artery which forms partial valves & thus prevents the flow. – The temporary suppression in these injuries is thus accounted for but their permanent cure can only be effected by inflnn; hence we see a certain degree of inflmn is necessary for a successful termination but if this is too great suppuration will be the consequence followed by secondary hemorrhage In gunshot wounds the blood is stopped in nearly the same way, but some times the ball sticking the artery kills a portion of it & no blood is seen to flow; in a few days, however, the portion sloughs off & a secondary hemorrhage take place; it is this which Army Surgeons as much dreads – & in such wounds he should be on the alert.

Treatment. – Every Surgeon should consider it his duty to suppress the hemorrhage as soon as possible – For this purpose in slight cases he should promote

Arterial Lesion

the coagulation by pressure with lint, sponge or any porous substance; in doing this he must be careful not to interpose these articles between the lips of the wounds but bring them together & endeavour to promote union by the first intention — The contraction of the artery may also be promoted by cold & astringent articles at the same time taking care not to wash away the coagulum between the edges, These articles are are classed under the head of Styptics — when the bleeding vessels are situated in unyielding parts as in the bone &c. or in such situations that they cannot be acted on as in the mouth &c. it will be necessary to form an eschar by the actual cautery but here there is danger of secondary hemorrhage — We must also endeavour to diminish the force of the circulation; in moderate cases this may be done by absolute rest cold drinks & a strict adherence to the antiphlogistic regimen but in severe cases it will be necessary to resort to V. S. even to syncope & in internal hemorrhage it is our only mode of cure --- Pressure must be resorted to when the artery is superficial & for this purpose compresses & bandages with the tourniquet are recommended; If the blood is found oozing out of a small artery; a compress & bandage are for the

Arterial Ligue

most part sufficient; but if the artery is large this will not answer tho' a wound of the brachial artery is said to have been cured by these means generally when this is the plan of treatment the canal is obliterated. The older surgeons where in the habit in cases of effusion to fill the cavity with lint all that is necessary, however, is to bring the parts together & promote union by the first intention — Graduated compresses have been recommended; but these also cause an obliteration of the canal. — When the tourniquet is thought necessary it must be applied between the wound & the heart; This is only to be used in sudden & severe cases until other means can be employed — The most important means in our power in such cases is the ligature — Mr. Lancer was the first who recommended their application use in suppressing the flow of blood. By their application the surfaces are brought into contact the blood soon coagulates & union takes place; When a ligature is first applied to the main artery of a limb the temperature of the limb is much diminished, but after a while the circulation is carried on by the anastomosing branches & the temperature usually exceeds that of the other — In a few days after lymph is secreted & union takes place the

the ligature acts as a foreign body, causes ulceration & is finally discharged -- Some surgeons have observed that union will not take place when we apply a ligature unless the internal & milde coats of the artery are divided; but this is a mistake as it is frequently seen to be the case as in aneurismal tumours &c. - Mr C Bell on the other hand declares that simply applying a ligature under the artery without compressing it will cause sufficient inflm to obliterate the canal hence he says that it is not necessary for the internal coats to be divided. It has been suggested to divide the internal coats by a ligature & then remove it, but this is not depended upon - Mr Travers suggested the removal of it in a few hours whether divided or not. I think however that the most certain practice will be to divide the internal & milde coats & in this we shall be supported by nearly all the distinguished surgeons in this country & Europe - Thos Scarpa, Bell, & some others oppose this plan & suppose that pressure is quite sufficient. - I prefer the division of the coats, because I

believe it to be much the safest plan & more certain of success besides union will occur much sooner than by the other plan – Hence our object should be not only to put a stop to the flow of blood but to divide the inner coats as that union may be more speedily accomplished; For this purpose the ligature should be strong small & round & at the same time care is necessary but in the application of it we divide the external coat – Scarpa, Bell, & others prefer the flat ligature but tho' they would answer in many cases I would rather not use them – In either case we must including a nerve fascia &c in the ligature as they will retain the ligature much longer than is necessary causing irritation & a great deal of pain – In tying it we must do so as close to the end (if sound) as possible so as not to cut off its nourishment from the vasa vasorum – Whenever a large artery is cut it will be necessary to apply two ligatures one above and the other below as it is apt to bleed from its inosculating branches at the same time – We must cut off one extremity of the ligature so as to lessen the irritation as much as possible; Some Surgeons when they wish to promote

Arterial Tissue

union by the first intention cut off both but the knot then causes an abscess which is as bad as the wound itself. — To obviate this Dr. Physick suggested the use of the animal ligature which is taken up by the absorbents, — this plan has been adopted in this country & by many of the English surgeons — The knot however is absorbed very slowly & sometimes causes much irritation, on this account he recommends no to use a very thin slip of muslin to facilitate its passage externally —

To produce a permanent cure infl.n must take place. — Some times the infl.n is too weak & when this is the case the impetus of the blood will overcome this slight union & secondary haemorrhage will result — But generally the inflam.n will be too great & in some cases it is very severe — This may be produced by several causes as improper ligatures or an improper mode of applying them or pressure or mechanical injuries of any kind — This inflam.n differs according to the degree of injury & instead of being confined to one part spreads along the whole internal coat & is called arteritis. Sometimes death is produced in consequence of its extending to the heart When the infl.n is slow no ill consequences will ensue, but some times it is very great

Arterial Tissue

causing an effusion of coagulum lymph, as in croup which finally obliterates the cavity of the artery; In some instances this is effused in the coats of the artery; this generally arises from wounds of the artery itself; but sometimes it spreads from the surrounding parts. In one case the caliber of the aorta was obliterated by it - for this case consult Hodgson - Crampton says that in many cases the constitutional symptoms are very great & this is often the cause of death after amputations. Pathologists generally have not very accurately noticed this disease & the symptoms have not been laid down by any writer - A Cooper is the only one who points out a diagnostic of this disease, he says that the limb will be found stiff with great pain on moving it Apparently very little danger arises from the effusion of lymph but if it run on to ulceration it is very dangerous. - Sometimes pus is formed without ulceration in such cases it is generally carried on with the current of the blood; in other cases it is formed between the coats of the artery & is then very dangerous as it is always accompanied by ulceration & effusion of lymph; Spontaneous ulceration often occurs in arteries as an original disease unless from surrounding parts or from the application of ligatures when diseased - & Sometimes in a

Arterial Tissue

very irritable constitution the ligature will cause hemorrhage before any union takes place. In such constitutions it may also take place from the artery being seated in a bones & from this cause we have hæmoptisis, & hæmatemesis &c. here the hæmorrhage is secondary. — For these reasons we should never apply a ligature to an artery of a man whose constitution is depressed without first correcting it — Arteries are also liable to the gangrenous inflam^n & this may result from the mere violence of the original injury as in Gun shot wounds; in such cases they are followed by severe & dangerous bleeding but most injuries of this kind arise from its spreading to the artery from the surrounding parts; as the artery possesses great vitality, they will resist this process for a great length of time; tho' situated immediately in the centre of a large abcess. When mortification takes place hæmorrhage rarely does as the adhesive infl^n usually precedes it; the second cause that the blood in the artery coagulates, the reason of this is not known as it is found extending above the line of demarkation; the most probable supposition is that the blood is at rest & coagulates

before the parts die but in all cases the adhesive infl.n takes place previous to the separation of the parts by ulceration — here the constitutional symptoms are very severe & the same as those mentioned when speaking of mortification as a termination of infl.n.

Aneurisms.

They have been defined by surgeons to be a bloody tumor communicating directly or indirectly with an artery — They are found in different parts of the body & are known by the name true or false. True aneurisms are formed within the coats of the artery; & the tumour is covered by one or more of its coats & communicates with the tube. — False aneurisms exists when there is a direct opening into the artery thro all its coats & the parietes of the tumor & are formed by the surrounding parts adhering together — True aneurisms never form in healthy parts; hence we shall not now speak of them. — False aneurisms arise from wounds in healthy arteries; The first I shall speak of is Diffused False Aneurism or primitive — This is produced as I before mentioned by an opening made into a healthy artery & in consequence of its

Arterial tissue.

obliquely the blood cannot escape externally & is therefore diffused in the cellular membrane so as to inject the whole limb which becomes very much distended & by its pressure may in some instances put a stop to it; the effusion continuing to take place however the limb is more distended which interrupts the circulation & the limb becomes first cold & numbed then mortifies. In some cases the skin & cellular membrane retard in some degree the discharge when this happens a small tumour directly over the orifice is formed, which is of a livid or marble colour with a tremulous pulsation. This diffused false aneurism is dangerous from the extent of the blood effused & the liability in the parts to mortify

Treatment here is the same as in the divisions of the artery with some slight additions. In the first place a tourniquet should be applied & then if possible we should apply a ligature to both orifices. At the same time we must make free incisions into the part & evacuate the coagulum from the cellular membranes as much as possible & endeavour to produce union by the first intention; tho' this is hardly ever accomplished for the blood in the parts is liable to putrefy from exposure

Arterial Lesions

to the air, If this happens we must amputate & this is our last resource -. In most cases, however, of punctured arteries, the immediate flow of blood is arrested by pressure from some assistant & there is not much infiltration in such cases a coagulum forms at the orifice in the sheath of the artery & by its pressure it put a stop to the flow; Inflammation then takes place lymph is thrown out & the part adhere - but it sometimes happens that the natural cure is prevented & this may occur from a variety of cause as motion &c - When this is the case these slight adhesions are forced. - The coagulum is removed from the orifice & the blood by the contraction of the heart is driven into the cellular tissue; but it does not spread in consequence of the adhesions in the surrounding parts, the force of the heart & arteries drive the blood into the part & a circumscribed tumour is formed which gradually becomes larger To distinguish this from the diffused it has been called False circumscribed aneurism Some times this is caused by the bursting of a true aneurismal tumor & is then termed a False consecutive aneurism - This tumor commences in a few days after the accident or it may be delayed for one or two weeks - It is oval & at first

arterial Tissue

the colour is not changed. - It has little or no pain & pulsates; this pulsation may be arrested by pressure on the artery above the injury & when small the sac may entirely emptied by the same means, but returns when it is removed. - When large the pulsation cannot be distinctly felt & the tumour cannot be entirely removed by pressure; the reason of this is that the blood is coagulated in the cavity of the sac & this takes place in layers. Hence old aneurisms become less pulsatile & more firm. - If dissected the blood is found coagulated in them in different layers within the membranous sac particularly at the sides while the centre remains fluid. When thus formed it usually continues slowly to enlarge by the impetus of the blood & if adhesion did not take place they would spread in every direction. The pressure of the tumour gradually causes an absorption of the surrounding parts causing swelling & great suffering. - This is generally the end of all neglected aneurismal tumours - The nature sometimes accomplishes a cure of which 3 kinds are recorded. 1st When a aneurismal tumor is very large by its pressure it causes severe inflm which unite it

to the surrounding parts & terminates in mortification by which the whole tumour sloughs away, sometimes the hemorrhage kills the patient, but in some rare cases the whole cavity is filled with coagulated blood which prevents the entrance of fluid blood until granulations are thrown out & union takes place if the patient constitution be strong enough to bear the demands made upon it. The 2nd Cause is by pressure made upon the artery with which the sac is connected. When these tumors are formed, the current of blood by its impetus cause the tumor to press upon the lower parts of the artery & it becomes obliterated by adhesion the blood above the tumor then being at rest coagulates & then give an opportunity for the canal above to be obliterated by adhesion — The 3rd is by the coagulum in the sac gradually increasing until it is filled up & then extending into the artery it blocks it up & finally obliterates it — This is by far the most common method — Hodgson has shown that in large arteries of the body the sac may be filled with the coagulum & finally be cured while the artery remains pervious, especially in the aorta — This 3rd method is a very desirable process; but it seldom occurs in small arteries without an

Arterial Tissue.

obliteration of its canal; tho' a case of its occurrence in the brachial artery is recorded — Of course in these cases, the blood no longer finding ingress, the tumour does not increase but absorption going on the coagulum is reduced in size until at length it becomes a small ligamentous tumour. While this is going on in the main artery other effects are obtaining in the smaller. When it first occurs there is a sensation of coldness, pain & numbness in the limb, but this does not long continue as in a few hours the temperature gradually returns & exceeds that of the other side; While at the same time the pulsations can be distinctly felt to increase as the temperature returns & the smaller vessels appear to be turgid; Hodgson says that they generally are all enlarged at first, but that only a few of them remain permanently so which finally carry on the circulation. In some cases, however, the small are not at all enlarged, the inosculating vessels carrying on the circulation at once while the main artery contracts to the first anastomosing branch. It was formerly the opinion of many that the vessels coming from the artery were first enlarged. Hodgson, however,

arterial Tissue

proves that this is not the case & he declares that it is the smaller & more superficial vessels that are first enlarged. Scarpa says, that when an artery is obliterated from any cause the blood meeting with the obstruction 1st. instead of distending the artery, leaves that artery & goes to another; by which it is finally obliterated & not enlarged as formerly supposed. From these remarks we are to infer that when an artery is obliterated that it is the capillary vessels which carry on the circulation by enlarging. but after a short time those coming directly from the artery supply their place while they contract to their former dimensions.

Treatment of Aneurisms.

This is to be founded on the following fundamental principles — 1st. Aneurismal tumors enlarge simply from the propulsive force of the heart & arteries — 2nd. a spontaneous cure occurs in those cases in which the force of the circulation being sufficiently diminished. blood coagulates in the tumor. — 3rd. If the force of the heart & arteries be too great the tumor is ruptured & death occurs. — Therefore the great indication will be to favour this coagulation of blood in the tumour & this is to be done by

Arterial Tissue. —

medical & surgical means — By medical means we are to diminish 1st. the force of the heart & arteries by active bleeding, low diet, absolute rest of body & mind, leeching &c. — Ice will also be found of service when applied to the tumor & the vessels by diminishing the determination to the part & facilitating its coagulation. When the antiphlogistic treatment has been carried to a sufficient extent the coagulum forms much more readily & in most cases where spontaneous cures result this has generally been the plan of treatment. — Valsalva was was the first to recommend this, but it was but little noticed until of late years. — To be effectual it must be carried to a great extent, particularly; 14 cases were successfully treated by him on this plan; as a general rule it is more important in true aneurisms it is the principal plan of treatment In aneurisms of the aorta we must be careful in using V.S. as if the patient faint he may not recover. — But in external aneurisms we have surgical means which are far superior. The first of these is pressure but the degree to which it must be employed is so great that few patients will submit to it; when this is the case great benefit will be derived from its moderate ap-

‡ in aneurisms of the large arteries. Valsalva reduced his patients until they scarcely raise their arms from the bed. —

arterial Ligature

plication combined with medical means already recommended; When pressure is to be used always be careful to commence with it at the extremity of the limb – The 2nd method is to open the tumor by free incisions (the tourniquet being first applied) turn out the contents & apply a ligature both above & below the tumor; particularly in false aneurisms as in true aneurisms it will hardly ever succeed as the artery is diseased & a secondary haemorrhage will be sure to follow – Many objections have been urged against this mode of operating – 1st the coats of the artery at this point are very much thickened extensive suppuration is apt to follow; the constitutional symptoms are very great as well as the danger from secondary haemorrhage besides which union by the first intention seldom or never occur & if it does the limb is generally stiff – All those dangers are very much increased in true aneurisms for as I before mentioned the coats are diseased. Hunter from the danger always attending this operation has recommended a 3d operat: tying the artery some distance above the tumour – the advantage here is that we have a sound part of the artery to operate on & it is easily found there is no fear of 2ndary haemorrhage

(1) There is difficulty in finding the artery great haemorrhage is apt to occur & there is great difficulty in applying the ligatures.

Arterial Tissue

besides which we escape the complicated dangers - arising from opening the sac. When applied the flow of blood immediately stops & the pulsation ceases, the circulation being carried on by anastomosing vessels; Sometimes, however, the pulsation is found to continue for some length of time after, but it is much weaker & the parts finally unite; here the vis-a-tergo is so much diminished that nature is enabled to accomplish a cure; that portion of the artery below the ligature remaining impervious down to the tumour the circulation being carried being carried on by the inosculating branches; This is in some cases prevented from taking place & mortification is the result. In such cases amputation will be necessary this, however, is rare, tho' it may produced in some instances by tight bandages, bad position of the part; pressure of the tumour &c all of which must be kept in mind & obviated if possible. It is more apt to occur in old persons & in those whose constitutions are depraved than in any others as their circulation is not so vigorous. On this account we must not bled as recommended by the french or apply cold & astringent lotions to the limb to diminish the action - A certain degree of heat is necessary to produce reaction; but it must not be too long continued

or too long delayed as dangerous consequences will follow both excesses.

There are some cases of aneurism in which the ligature cannot be applied to the superior part of the artery as in the groin, root of the subclavian, arteria innominata &c. Here the patient must submit & depend alone upon the medical means unless some other operation were substituted; On this account it was proposed to apply the ligature below the tumour supposing that it would operate in this case as in the suppression of haemorrhage that is the blood melting with an obstruction becomes coagulated up to the first anastomosing branch & the artery finally becomes obliterated -- Peletan was the first to try it, his patient, however, be a drunkard it failed. Cooper also failed from the same cause & the extreme age of the patient; This put a stop to farther trials until it succeeded in the hand of Wardrop & since his time it has again received & been successful in several instances -- Some surgeons were formerly of an opinion that there some times existed a hernia of an artery or as it was termed a mixed aneurism & that it was produced by a division of one or two of the coats of an artery, while the pulsations of the heart caused the other coat or coats to be protruded thro' it but it is believed that this never

arterial Tissue.—

takes place & the experiments of Hunter go against the opinion he has satisfactorily proved that instead of the internal coats distending they become much contracted & thickened!. Jones was also of this opinion & says that the impetus is never sufficient to distend the inner coats; his experiments tend to prove this — Nor is this the case when a ligature is tied & then removed — Crampton also says that is not true of an artery in a healthy state — In fine surgeons at the present day have given up all idea of such a thing as a mixed aneurism.

Injuries of Veins.

The structure of veins is nearly similar to that of arteries only that they are more delicate & do not possess elasticity or vital powers consequently do not carry on the circulation so well; When empty they collapse — Their office is to carry blood to the heart; as well as other tissues of the body they are subject to lacerated & contused wounds; When this happens it may be known by the blood being darker than the arterial; its flowing more regularly & being suppressed more easily by pressure — The effect of their bleeding is not so great on the system as that of the arteries hence the

Arterial Tissue

danger of hæmorrhage in wounds of veins is not so great; but as respects inflm it is more so. Mr. Hunter says that veins will minutely prefure & that they are very liable to continuous inflm; abscesses are also liable to form on the internal surface which generally open externally - Mr. Travers opposes this opinion & in some respects differs very much from Hunter - When a vein is completely divided the bleeding is arrested by it contracting; they are subject to longitudinal wounds as in bleeding; the lips in this case do not separate unlesf prefure be made above - after the blood is arrested the wounds heals & the canal of the veins remains pervious; When, however, the wound is transverse the parts do separate & the bleeding is profuse & require considerable prefure to stop it - When the blood has been arrested Mr. Travers has shown that it is by a coagulum of blood which projects in the cellular tissue & orifice of the vein & that about the 3rd day a new membrane is formed over the internal surface of the coagulum, which finally shuts up the orifice about the 10th day during which procesf the coagulum is gradually absorbed; it forms a continuation of

Arterial Fibre

the lining membrane of the vein only somewhat thinner; at the same time it is thicker than the valves & is the result of infl.n. – This membrane forms a pouch which becomes distended. – Some times in living animals, the horse particularly a number of them is seen generally occurring from bleeding. – When from circumstances either local or general this kind of union does not take place, the inflam.n becomes very severe involving surrounding parts & spreads by continuous infl.n along its internal coats particularly towards the heart; tho' in some other instances it travels the other way. – It is in this particular analogous to other serous membranes. – Lymph is generally effused & some times pus which extends to the auricles of the heart but ulceration seldom or never takes place; The inflam.n of the internal coat is very extensive some times throughout the whole extent of the arm or leg & in some instances even to the heart itself; it is similar to that described when speaking of arteries but occurs much more readily in the veins & is more dangerous In some cases the whole of the coats are involved in the disease – It is generally characterised by

Arterial Tissue

a suppurative state of the orifice with the edges inverted & sometimes erysipelatous infl^{n} around it – The vein is also much enlarged in some cases as big as the little finger & very hard – Under these circumstances the constitutional symptoms are very great; high fever & that of the hectic or typhoid type which generally proves fatal; particularly the latter, when the infl^{n} is not so extensive & death does not takes place a cure is generally accomplished by an obliteration of the vein; In cases where the pus is secreted it is generally circumscribed by the adherine infl^{n} forms an abcess & makes its way to the surface; but some times it opens into the cavity of the vein passes to the heart & causes death; Hunter has observed in the course of the vein many of those abcesses resembling small soft tumours all of which may be considered very dangerous. Such are the common phenomena in healthy veins when a cure has been produced by pressure; Here we might suppose the same phenomena would take place from the application of a ligature as in the case of the same application to an artery; But Mr. Travers observed that there is no separation of the internal & middle coats as they are folded or puckered &

Arterial Ligature

thus brought into the contact without any solution of continuity. When this done the vein below the ligature becomes very much distended with blood & it finally coagulates for some distance below while that above is empty - Finally union may take place, but it will be much slower than if the coats had been divided - Ulceration takes place about the 9th day or 20th - These are perhaps the ordinary effect of the ligature - but occasionally they are very dangerous, causing severe inflm which extends along the internal coat causing the same phenomena as mentioned in the wounds of veins - On this account some surgeons have said that a ligature should never be applied to a vein Why this inflm takes place more readily in veins than in arteries is not known; But Travers think that it is in consequence of adhesion not taking place in veins as it does in arteries - The question has also been agitated whether it depends upon constitutional or local causes - It can be doubt but they are generally local as from improper treatment, wounds &c tho' the constitution is occasionally at fault - It may also be caused by other means as pressure, abcesses &c & may like arteries become involved

Arterial Tissues.

tho' surrounding parts & may even becomes gangrenous; as they are not possessed of so much vitality as arteries they are much more easily affected by gangrene & secondary haemorrhage as a consequence is also more apt to take place.

Treatment.— The haemorrhage can easily be arrested by slight pressure & on this account there is no necessity for a ligature & it ought never to be used — Great care must be taken that in the dressings no foreign matter get in between the lips of the orifice; then bring the lips close together so that they may unite by the first intention; If the parts do not unite & inflm. come on we must strictly adhere to the antiphlogistic regimen — When typhoid symptoms come on we must attend to the abdominal viscera & treat as in usual in cases of this kind: In moderate cases nothing is so useful as warm poultices to the orifice & hot spirituous fomentations along the course of the vein; These failing cold must be tried. — Blisters are recommended by Dr. Physick & will be useful together with the application of a splint to keep the part at rest — Leeches must not be forgotten; If abscess

Arterial Tissue

form; open them externally. Hunter says that continuous infl.n may be arrested by pressure made between the wound & the heart so as to cause adhesion & an obliteration of the cavity. This is also valuable when suppuration has taken place to prevent the pus from reaching the heart; as cases have been recorded where death took place from raising the hand to the head.

Varicose Veins -- This disease I believe generally arises from some obstruction of the veins which is produced by many causes, as irregularities in the contractions of the heart or circulation in the lungs so also from violent infl.n here they become enlarged by the vis-a-tergo tho sometimes by pressure from tumours particularly in females from the gravid uterus; Great muscular exertion may also cause it - But the most common cause is from long standing; here the heart throwing the blood into the lower extremities causes them to become distended & this distension is rendered more effectual by active excitement determining the blood in still greater quantity to the part, also from the weakness of the veins -

At first they are of but little importance.

Arterial Tissue

but after a while they become painful & require the aid of the physician. Some times a spontaneous cure takes place tho' this is rare. Whenever any of the causes enumerated are present we find the veins very much distended & if the cause continues to act they may be ruptured (One or two instances have occurred of a rupture of the vena azygos which has produced by muscular exertion, but generally the blood find its way by anastomosing branches into the larger veins, those anastomosing branches become very much distended & in some cases remain dilated even beyond the size of the obstructed one Some times they appear in small pouches termed varices; at others they assume a serpentine course become elongated & are then termed varicose veins & in some cases have been mistaken for aneurisms. Deep seated veins are seldom affected because the pressure of arteries & muscles prevent it. but the superficial ones become very much enlarged. There is when this occurs an oedema of the limb. Perhaps this arises from pressure on the lymphatics As the disease advances the valves no longer prevent the pressure of a column. The blood circulates very slowly so much so that coagulation takes place

Arterial Tissue.

& renders the vein hard but this does not obstruct its cavity as the coagulum forms in strings in the centre of the vein. Mr Hodgson however relates a case of a spontaneous cure having taken place by the coagulum filling the whole cavity. the small superficial veins continuing to carry on the circulation — The veins cannot exist in this state for any length of time without nfl^n taken place which is generally chronic causing thickening of the coats & sheath also affecting the muscles & skin; Sometimes abscess form which extend to the surface by ulcerative infl^n giving rise to secondary hemorrhage which is sometimes fatal; at other times it give rise to varicose ulcers.

We can assist the spont aneurs cure by a. ligs, and if there be inflammation bad applications.

Varicose Ulcers. — They may arise from other causes than varicose veins as for instance an ulcer occurring in the patient at the time directly over the neighborhood of veins; Of these there are 2 kinds; in the first the edges are very delicate & of a brownish colour & the bottom dark & livid; in the 2nd stage the edges are unequal & indurated; In both cases there is a dull heavy pain — In fact varicose ulcers may be defined as nothing more than an indolent ulcer complicated with enlarged veins.

arterial Tissue –

Treatment. 1st The cause if possible must be removed; hence the necessity of medical means to open the bowels & surgical to remove tumors open abscesses &c. – 2nd When the cause cannot be removed we must endeavour to facilate coagulation in the superficial veins by pressure with bandages & endeavour to promote adhesion by recumbent posture & this will generally succeed. – 3rd When inflm has supervened & becomes inordinate it must be treated by antiphlogistic remedies as rest, purgatives, cold & pressure until the inflm abates. – 4th Should these fail & the varices become troublesome & dangerous an operation must be resorted to – The modes of operating are the following 1st The actual or potential cautery to the divided tumors but their use is always attended with danger – The second mode proposed consists in tying up the large trunk in which the vein terminates so as to cause a contraction, this is to be assisted by pressure so as to turn the course of the blood into the deep seated veins; but this is not always sucessful as other veins enlarge or the superficial ones continue to grow. Home tried it in diverse instances by tying up the vena saphena but it did not succeed

arterial Fistula

besides which it is always dangerous from causes previously mentioned — A 3rd Operation has lately been proposed by Mr Brodie, which is to divide the venous trunk in such a way that the incision in the vein shall not correspond with the incision thro' the integuments & in this way cause union by the first intention — Experience proves that this operation is some times fatal & surgeons of the present day would much rather trust to pressure — Pickersgill proposes to lay open the vein & tumors for some distance. Dr Hartshorne of this city & Le Franc of Paris recommends the excision of a part of the vein where it is healthy — Some times this will answer & I prefer it to any other operative; but this also some times proves fatal from the simple incision — This I believe arise from the vein being inflamed throughout or if not it is predisposed to it & the incision causes its development or else the continuous inflm occurs. For these reasons it is best if possible to avoid operation.

Aneurismal Varix, or injury in which the veins & artery are both involved — It some times happens that in bleeding the lancet passes thro' both coats of the vein & wounds the artery underneath, this may be

Arterial Tissue

known by the blood spouting out in jets & being of a bright arterial colour, by the difficulty in stopping the hæmorrhage. On removing the bandage the external orifice in the vein & that in the integuments close & soon unite while the posterior one is kept open by the blood passing from the artery into the vein, which finally becomes dilated from the impetus of the blood & over the surface a circumscribed bluish oblong tumour about the size of a hazelnut is seen with a tremulous thrilling or jarring sensation, & characterised by a wishing or hissing noise; It seldom becomes larger than a hazelnut, but after a while the part above becomes more enlarged & it rise towards the axilla; Occasionally, however, it descends towards wrist until it meets a valve. – It can be removed by pressure on raising the arm; on the contrary if the arm is lowered it will be much increased in size – Pressure made on the artery above prevents its pulsation while a ligature applied below it will have no effect. The brachial artery from losing a portion of its blood becomes larger & pulsate more strongly while that at the wrist is much weakened; After this has existed for some time the basilic vein becomes

Arterial Tissue

varicosed & forms a sac; aneurismal varix when completely formed usually remains stationary for life & no instance is recorded of its having been ruptured; tho' there is some increase in the size of the tumor; besides this there is some inconvenience arising from the diminutive size of the lower part of the limb arising from the deficiency of nourishment. It is seldom seen in any other place than the bend of the arm; sometimes however, it is found in the vena saphena and a case is recorded of its occurrence in the thigh & jugular. The prognosis is generally favourable; but it sometimes happens that the orifice is oblique between the two or that the vein & artery are separated for some distance, so that a portion of the blood does not pass directly into the vein but a part of the blood is diffused in the cellular tissue between the artery & vein forming an aneurismal tumor communicating with the vein. It is then called a varicose aneurism. Here the circulation being partially arrested the pulsation is not so strong & it may be known by pressure emptying the vein, but it will not remove the tumor. It is free from trembling. In this case we have aneurism connected with varix, here

Arterial Tissue

there is some danger from bursting accompanied by all those arising from aneurismal varix but less dangerous than other aneurisms

Treatment – The treatment of simple aneurismal varix at first is only palliative; avoid continued & severe exercise & keep the arm elevated; Some Surgeons employ pressure but Boyer says that it is of no advantage as it will cause greater effusion in the cellular membrane; while Scarpa highly recommends it & says that it has succeeded often in his hands, but the degree of pressure is so great that the patient will seldom submit to it. If any operation is necessary the artery should be exposed both above & below the tumor but this is seldom required. Scarpa recommends the obliteration of the artery by pressure against the os humeri. When however it is complicated with effusion into the cellular membrane the surgeon is required. – The Hunterian operation will not succeed here No method of operating will answer here so well as that proposed by Dr Physick; He cuts down upon the artery & tying it above & below the tumour takes out the whole diseased portion – Parker of Liverpool tyed the artery but left the

Absorbent Tissue

tumour to be removed by absorption, back patients recovered. —

9th Absorbent System

The structure of the absorbents from their size are but little known but from analogy they are supposed to be similar to that of the veins; internally a delicate serous membrane & externally a thick dense fibrous coat, connected to surrounding parts by cellular tissue; They are liable like others tissues to various accidents tho' rarely indicated by any particular symptoms; occasionally they become subject to continuous inflm which commences in the internal tissue spreads to the external tunic & extends to the lymphatic glands; It may be known by a small red line extending upwards towards the glands tho' occasionally downwards sometimes, however, there is no discoloration but the inflm must be severe before this is seen as here the other coats of the absorbent cellular tissue & skin must be involved previously to its appearance — When examined they are found to be hard indurated cords from the effusion which surrounds them & knots are felt from the enlargement of their valves. Of this inflm the gland generally partakes & become swollen; this is sometime the

Absorbent Tissue

ofint symptom & it not unfrequently occurs without the vessels being at all perceived to be in this state; this is owing to the inflm being seated in its lining membrane — Generally in these cases the glands become the bond of union the inflm spreading no further; Some time all the superficial absorbents of the limb become inflamed causing great swelling & pain & also violent constitutional symptoms of a hectic or typhoid character which is much dreaded by all surgeons; The diminutive size of the absorbents do not allow an investigation into their state; but we have reason to believe that lymph & pus are effused as in veins & that pus is some times carried into the circulation abcesses also frequently forms as in bubo — When severe these involve the contiguous tissues & burst externally. These abcesses are very common in the groin & axillae but are also seen along the course of the vessel. —

The Causes may be classed under 3 general heads. The first may be considered as internal causes viz certain states of the general System as cold, certain fevers, peculiar states of the chylopoetic viscera & as in plagues Yellow fever &c. When from cold or disorders of the

a different treatment according to the tissue in which it is located. —

Inflammation modified by different organs and their capsules

1st. Injuries of the Head

In consequence of blows on the head there is frequently an effusion of blood under the periosteum & which is circumscribed & often mistaken by surgeons for fracture this must be opened & the blood evacuated

Wounds of the scalp are similar to those of any other part of the body but there is a species dependant upon an affection of the nerves termed neuralgia of the scalp, characterized by severe pain at the spot & extending over the whole scalp & all this after the wound has healed — When the spot is examined there is no symptom of infl^n except increases of pain on pressure Treat: Dr Physick cut down to the scalp & thought that he cured it but this has frequently failed. — He also thought that he cured it by emetics but they are not to be depended upon. The remedies for this affection are various as emetics, narcotics, incisions absolute rest &c. — In extensive wounds

Concussion

of the scalp there is always danger from the use of sutures as they generally give rise to erysipelas; on this account it has been recommended never to apply a ligature to wounds of the kind but always to depend upon pressure. Punctured Wounds are more dangerous as they may cause deep seated inflⁿ of the scalp & bound down by the fascia. When this does occur it will require deep incisions for its removal. — The Treatment of wounds of the scalp must be varied according to circumstances but there is generally much danger attending them. — Injuries of the head may be said to be of two kinds direct & indirect; the direct resulting from blows & the indirect from inflⁿ. The direct relate to wounds of the scalp cranium, dura matter, pia matter & the brain itself; Frequently the brain is affected by a blow while the scalp is but little injured. As regards the effects produced upon the brain itself one may compare them to contusions. — When speaking of this I mentioned that there were three degree of contusion, 1st a total or partial loss of function; this, in the brain, is termed Concussion; where is complicated with

Concussion

contusions within a solution of continuity & extravasation of blood giving rise to compression of the brain. 3rd When there is a completely disorganized state causing death of the patient all of which are complicated with each other & under various circumstances. By Concussion then we are to understand nothing more than the first degree of Contusion or a partial loss of function & as the brain presides over all the other organs; very important effects are produced; The first degree there is a slight stunning, some vertigo sickness of stomach, pain in the head, slight alteration of pulse dimness of vision & trembling of the limbs — If the concussion is greater the patient is comatose; respiration is scarcely perceptible; free from stertor, extremities, cold, face & skin pale pulse weak & slow & intermittent. & the pupils dilated. In this state the patient cannot remain long without some change as if reaction does not takes place he will soon die: This reaction is called the 2 stages of concussion. When reaction is about to take place there is a partial restoration; the carotids are seen to pulsate & the pulse to increase in

frequency. After this in some cases these symptoms of reaction gradually decline & the patient recover; but in others they become more violent & terminate in Phrenitis or the 3rd Stage of concussion. Concussion of the brain is caused by many circumstances as falls upon the knees feet, buttocks &c, but the worst form of it is produced by blows upon the head — Whether these symptoms can occur without the rupture of blood vessels was at one time much disputed, at present, however, it is satisfactorily proved that concussion can take place without any disorganization. A case is recorded in which the patient long struggles & then suddenly & perfectly recovered.

Treatment. Much judgement is required in distinguishing the Stages. During the first stage but little can be done, if we were to bleed as formerly recommended, we should exhaust the little remaining of the patient & terminate his existence; on the other hand if we were to resort to stimulants we will be apt to increase the infl.n & make the case much

worse; besides which from the great debility of the brain & its extreme delicacy we are in danger of producing effusions; hence in all ordinary cases stimuli are inadmissible If however the patient is sinking it may be had recourse to and then it should be principally external as placing the feet in hot water or the use of a warm semicupium or injections of asafoetida; In some cases where the prostration is very great a little wine or spirits may be thrown down the throat; but in such desperate cases we have but little to hope for — We must therefore wait patiently for reaction. —

When the 1st Symptoms of reaction take place, the indications are to prevent effusion on & impl.n of the brain; This is to be done by the rigid antiphlogistic regimen; V. S. free purging; low diet; antimonials & perfect rest. We must also shave the head & apply cold which prevents effusion assisted by cups & leeches. We must even keep the vessels of the brain below par — by pursuing this plan rigidly we are enabled to prevent the 3rd Stage The patient generally recovers very slowly but in some cases never perfectly as he is affected by loss of memory. —

Effusion

When the injury has been produced by a blow we often have the 2nd division of contusions with lacerations of the internal structure in consequence of which we have paralysis & death under the head of compression we may have an effusion of blood & depressed bone accompanied by loss of function.

Effusion of blood. The cranium contains the brain enveloped by the membranes; the dura matter supplies the place of the internal periosteum – The arachnoid is double lining the internal surface of the dura matter & the external of the pia matter – consequently a complete cavity is formed & when blood is effused it is some times in this sac. In consequence of the dura matter answering as a periosteum & adhering closely to the internal surface of the bone; a blow often cause a separation of them & then an effusion take place between the dura matter & bone at this part – It may however be situated between the arachnoid & pia mater or on the ventricles of the brain themselves; when between the dura matter & cranium it is generally circumscribed but when it is between the two layes of the arachnoid it is spread over nearly the whole surface of

Effusion

the brain. When in the substance of the brain it is but slight. The symptoms of slight compression are headache. When greater there is dimness of sight; now if there is an effusion exterior to the dura mater & we trephine we shall remove all the blood — But if no blood is seen & the dura matter protrudes we may be certain that it is in the cavity of the arachnoid — An experienced surgeon would in such a case puncture the protrusion — but if he did dangerous consequences would follow as it is coagulated & the blood becoming exposed to the air becomes putrid causing violent & dangerous symptoms — Some cases however are recorded in which it was successful but it must have been performed immediately after the accident while the blood was fluid From these dangers then we had better trust to the absorbents when thus situated, also when seated in the ventricles of the brain & indeed the latter case it must be fruitless at any time. — When it is complicated with fracture it must be treated in the same way as when blood is effused exterior to the dura mater — First endeavour

to produce absorption; & if you do not succeed you must elevate the bone & resort to the operation of trephining; Symptoms of depressed bone are the same as those of effused blood; but as Dr. Harris has treated of both I need make but a few remarks; Some times the fracture is compound — Here we must at once elevate the parts & if this does not succeed remove the depressed bone by an operation — Whenever a fracture is complicated with a wound of the brain or its membranes it generally proves fatal; When it occurs strict antiphlogistic treatment is required, — Never cut away any portions of the scalp for if it adhere at all it will unite the adhesive inflm. — In dressing the parts do not employ any pressure & allow a free discharge of the fluids or you will produce compression Coval with this a strict antiphlogistic plan must be adhered to, — In Gun shot wounds if the ball can be found it may be removed by enlarging the opening with a Trephine, but no extensive probing can be allowed. — When small openings are made they may unite by bony matter; but, when

Injuries of the Head

large they are only covered by a dense membranous cicatrix which must be protected by a plate of metal. — —

Indirect consequences are the result of infl^n of the different tissues — In inf^n of the scalp as it is generally bound down by the fascia it will be necessary to make incisions to relieve the pressure. — When infl^n of the cranium occurs, it is generally confined to the external table & may terminate by exfoliation. — This usually results from a direct blow

Pott, however has mentioned a complication of a more serious nature viz: inflam^n taking place in the diploic structure running on to suppuration & causing a destruction of the external table sometimes extends to the internal table and even to the membranes of the brain. It may be known by a puffy tumour fixed pain without any fever or general affection of the brain &c. — This tumor appear to contain air and is produced by the separation of the periosteum from the bone; but, it has nothing to do with the disease. When this inflammation is left to nature a cure is

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When this inflam. is left to Nature, a cure is sometimes accomplished by a separation of the external table by absorption or exfoliation, which allows the matter to be evacuated, but it is a very tedious process; occassionally, however, instead of being discharged in this way, it spreads in every direction in the diploe, in many cases destroying the internal as well as the external tables, separates the dura mater and finally causes death, all of which arise from the matter being confined. The indication here is to form an outlet for the matter, and in this way we may often save the patient. Another consequence of a blow or Gun-shot wound is the of the whole thickness or both tables of the bone. It may also arise from inflam. of the bone terminating in Gangrene, and sometimes by a separation of the periosteum, depriving a bone of its nourishment: but from whatever cause it is always attended by a separation of the dura mater from the inside of the bone, somewhat analagous to what is seen in necrosis: here the bone acts as a foreign body causing the dura mater to inflame, and is consequently attended by great danger. The Inflam some arises from other causes, as a spicula of bone, and sometimes from a blow or contusion. It can

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says Pott, be distinguished from Inflam. of the arachnoid or pia mater, by the circumstance of the patient complaining for a few days of a slight fever with a dull pain, accompanied by nausea &c. Should these continue delirium comes on; a stop not being put to the symptoms rigors make their appearance accompanied by headache thirst, delirium convulsions and death. During this process important changes are taking place at the part if the bone be embroken. A swelling is gradually formed, and when opened the periosteum will be found loosened from the bone and containing a dark Sanies with an attenuation of the bone. In the more advanced stages, and when the patient is affected with rigors, the bone will be found dead, & if this be removed the dura mater will be found in a detached or gangrenous state with a purulent secretion which extends to some distance under the membranes in the substance of the brain. Death however usually takes place before Inflam has gone so far. In those parts where the scalp has been torn off the parts appear healthy but the granulations in a few days become flabby and are entirely absorbed with a discharge of sanies from the internal parts; the pericranium becomes

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attend, this arises from the Inflam. being determined to the internal parts: hence the application of blisters and other counter-irritants is required these affections are always dangerous, because they involve the brain, in some cases the dura mater from being irritated becomes very much thickened by a deposition of coag: lymph, and causes pressure of the brain: pus also is sometimes formed. When near a suture or when an opening has been made in the bone the pus is evacuated, the dura mater granulates, finds its way thro' the cranium, and appears of a fungous nature caused as I before mentioned by irritation of the dead bone: sometimes however I believe it to be a primary affection of the dura mater, & of itself will remove the bone: It has a pulsatile motion and has been mistaken for aneurism. The original source therefore is the inflam: of the dura mater, which often commences before the bone is dead: here the anti-phlogistic treatment rigidly enforced may prevent or arrest it after it has commenced. In case of fracture the dead parts must be removed for if left to the usual process of nature the patient will generally be destroyed. We should in all such cases interfere and remove the dead bone so that the parts may

over

granulate. To what extent the cranium may be removed is not exactly known. Haller mentions a case where 6½ inches were removed. At any rate a sufficient portion must be removed to prevent the accumulation of fluid, and as a general rule we must remove all that is diseased. As regards the fungous growth, it may generally be suppressed by removing the presence of the dead bone, after this the parts will heal and the fleshy excrescences will disappear. If necessary it may be retarded by pressure or even escharotics, but I do not like the latter. In cases of original fungus, we may remove the whole tumour, but here the chance of recovery is very bad. This kind of Inflam is sometimes of a chronic character lasting for years.

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